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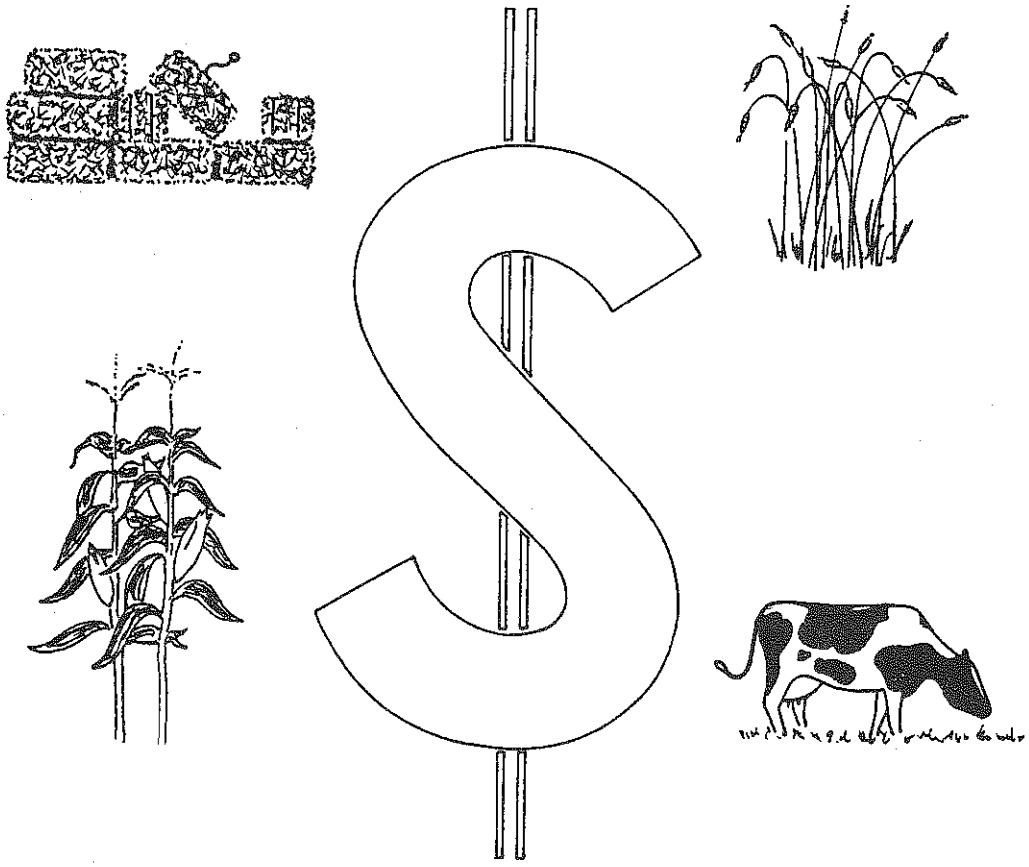
AN ECONOMIC ANALYSIS OF NORTHERN NEW YORK DAIRY FARM ENTERPRISES: FREESTALL HOUSING SYSTEMS



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FOREWORD

Enterprise budgets have been published previously for New York dairy farms (Knoblauch, Milligan, and Woodell: An Economic Analysis of New York Dairy Farm Enterprises). However, because conditions in Northern New York are somewhat unique, a series of enterprise budgets were constructed specifically for this area. The budgets were originally constructed as a part of a study of profitability of drainage improvements on Northern New York dairy farms. The resulting enterprise budgets are contained in two publications. This publication contains crop and dairy livestock budgets most useful to managers of farms with a freestall housing system; a second publication, An Economic Analysis of Northern New York Dairy Farms: Stanchion Housing Systems, contains enterprise budgets designed for farms with stanchion barns.

The method and format used are similar to those used in An Economic Analysis of New York Dairy Farm Enterprises. Any changes in calculation methods are discussed in the construction procedure section of this publication.

The Gross Income, Selected Variable Expenses, and Labor Requirement data from the enterprise budgets as well as feed requirements for the dairy livestock are designed for use with the Profitable Organization of Dairy Farm Enterprises forward planning computer program (NEWPLAN Program 65). Region codes are used to indicate quality of the hay crop forage. Region 3 budgets contain information most useful to farms harvesting a grass hay crop. Region 4 contains information most useful to farms harvesting a mixed mainly legume hay crop.

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Linda Putnam deserves credit for many of the little things which had to be done, and for typing the manuscripts--one of the big things.

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INTRODUCTION

Enterprise budgets in this publication are constructed to reflect the climate, soil resources, farming practices and economic conditions in Northern New York. The information contained in this publication is prepared for a specified land base, dairy herd size, and corresponding building and machinery complement. The crop enterprise budgets are constructed for a land base of 200 tillable acres. The dairy livestock budgets are constructed for an 80 cow herd housed in a freestall barn with feed stored in concrete tower silos. Costs and returns for these budgets are based on 1977 price levels in the region.

Some Background on Northern New York Agriculture

Northern New York is generally considered to consist of six counties: Jefferson, St. Lawrence, Lewis, Essex, Franklin and Clinton. They extend in a crescent from the eastern end of Lake Ontario up around the northern edge of the Adirondack mountains to the northwestern shore of Lake Champlain. Soil resources in Lewis and the southern half of Jefferson Counties make the budgets in Knoblauch, Milligan, and Woodell more suitable for them. The remaining area is by no means homogeneous, but common characteristics do exist. The mountains have somewhat isolated the area from the remainder of the state. Much of the region is a plain of heavy soils. The sparse population is traditionally agricultural with dairy farms and forest the predominant uses of land. As a region, it is one of the major milk producers in the state: St. Lawrence and Jefferson Counties ranking first and second in cow population and total milk production in the state (New York State Crop Reporting Service).

The resources available and climatic conditions have strongly influenced farmer's activities. The land is most suitable for crops traditionally fed to dairy livestock. Long distances from markets have led to the establishment of cheese and butter-making industries. The long cold winters and wet springs and falls are often said to be the dominant characteristics of the local environment, delaying planting and other operations (Lucey, 1977b). Dairy farmers have adjusted to these conditions by farming the land extensively, raising proportionately much more grass hay than is raised in other regions of the state. That is, the production system has been adapted to the environment.

Within the region, dairying outstrips the other important agricultural industries: apple, potato and birdsfoot-trefoil seed production (Lucey, 1977b). The economic importance of dairying is shown by its role in an input-output model developed for Clinton County (Hizer and Fisher), which indicates that milk producing and milk processing are two of the top five potential contributors to growth in income and employment in the county.

Much of Northern New York is a low-lying nearly level to gently sloping alluvial plain of the St. Lawrence River Valley. Many of the major soils, such as Kingsbury, Rhinebeck, Niagara, Pittsfield and Hogansburg have surface horizons of low permeability. Other soils are underlain by a

fragipan, as Naumberg, Westbury, Brayton and Swanton. Some 45 percent or 594,000 acres of the cropland is classified as poorly drained (Lucey, 1977b).

By delaying tillage in the spring, poor drainage shortens the effective growing season. It also keeps the soil from drying after fall rains and often makes harvesting difficult. The result has been a favoring of less risky grass hay forages. Corn silage planting and harvesting operations are frequently hampered by excessive soil moisture. Two tractors in tandom may be able to pull a forage chopper and wagon through a muddy field, but this is an expensive way to harvest corn. There is also the element of risk--that the corn may never be harvested at all, which happened on many farms during both the 1976 and 1977 seasons. Planting later and harvesting earlier may avoid the wet seasons, but will shorten the growing season even more, further reducing yields.

Hay crops, which have a different harvest schedule and need not be replanted annually, suit the situation better. Grasses are common, because of the poor drainage. Although, the hay might be improved by the inclusion of alfalfa, this is rarely done because alfalfa is very sensitive to poor drainage, which aggravates winterkill. Birdsfoot trefoil is an alternative which would otherwise be second choice. However, it too, is more sensitive to poor drainage than grass. Though few farmers go to the extreme of depending totally on large acreages of pasture and grass hay, many are near that end of the sprectrum. Among farmers completing a Cornell farm business summary, the average area of roughage per cow is larger in Northern New York--2.69 acres versus 2.48 acres statewide (Bratton, 1977a, 1977b). In addition, yields are somewhat lower. Improved drainage would allow legume-based hay crops to enter the cropping program. Because of the current predominance of grass hays and the interest in improving drainage for planting legume-based hays, both were included in the enterprise budgets. The differences between the grass and the legume hays in the study are yield per acre and nutrient content.

Resources, crop and livestock enterprises and production levels analyzed are contained in Table 1. The 80 cow herd size is slightly larger than the 61 cow average for all types of dairies found in Bratton 1978, but is likely closer to the average for farms with freestall housing in the area. In addition to the 80 cows, resources include 56 heifers, 100 acres each of hay crop and corn silage, and 75 acres of pasture. The total 300 acres includes another 25 acres of land which is likely to include the farmstead, a woodlot and other unused land. The 200 tillable acres is comparable with the average 188 reported in the farm business summary.

Dairy livestock enterprise budgets were constructed for forage mixtures with varying proportions of hay crop and corn silage. The yields noted in Table 1 were chosen in consultation with Cornell staff (Swader, Lucey, Milligan, Klausner, Knapp), extension personnel (Thomas, Yates), and others (Wilson) familiar with the region.

Table 1. Resource Availability and Production Levels Specified for Construction of the Enterprise Budgets.

Resources	Enterprise	Size	Production Levels
Freestall housing; for 80 cows; milking parlor; scrape barn and spread manure daily	Dairy Cow	80 head	10,13,16, and 18,000 lbs. milk/year
	Heifer replacement	56 head	
	Total	136 head	
	Hay Crop Silage[a/]	100 A	3.5, 5.4, 7, and 10 T/A
	Corn Silage[b/]	100 A	8, 12, 16 and 18 T/A
	Pasture	75 A	1.0 T/A
	Homestead	25 A	
	Total Land	300 A	

[a/] 40 percent dry matter.

[b/] 30 percent dry matter.

Construction Procedure

The approach used in constructing these enterprise budgets was to build upon previously acquired data (Figure 1). The first step was to establish resource levels, which serve as a base. Enterprises sizes, dairy housing systems, ranges of possible yields and land bases representative of Northern New York dairies, were specified.

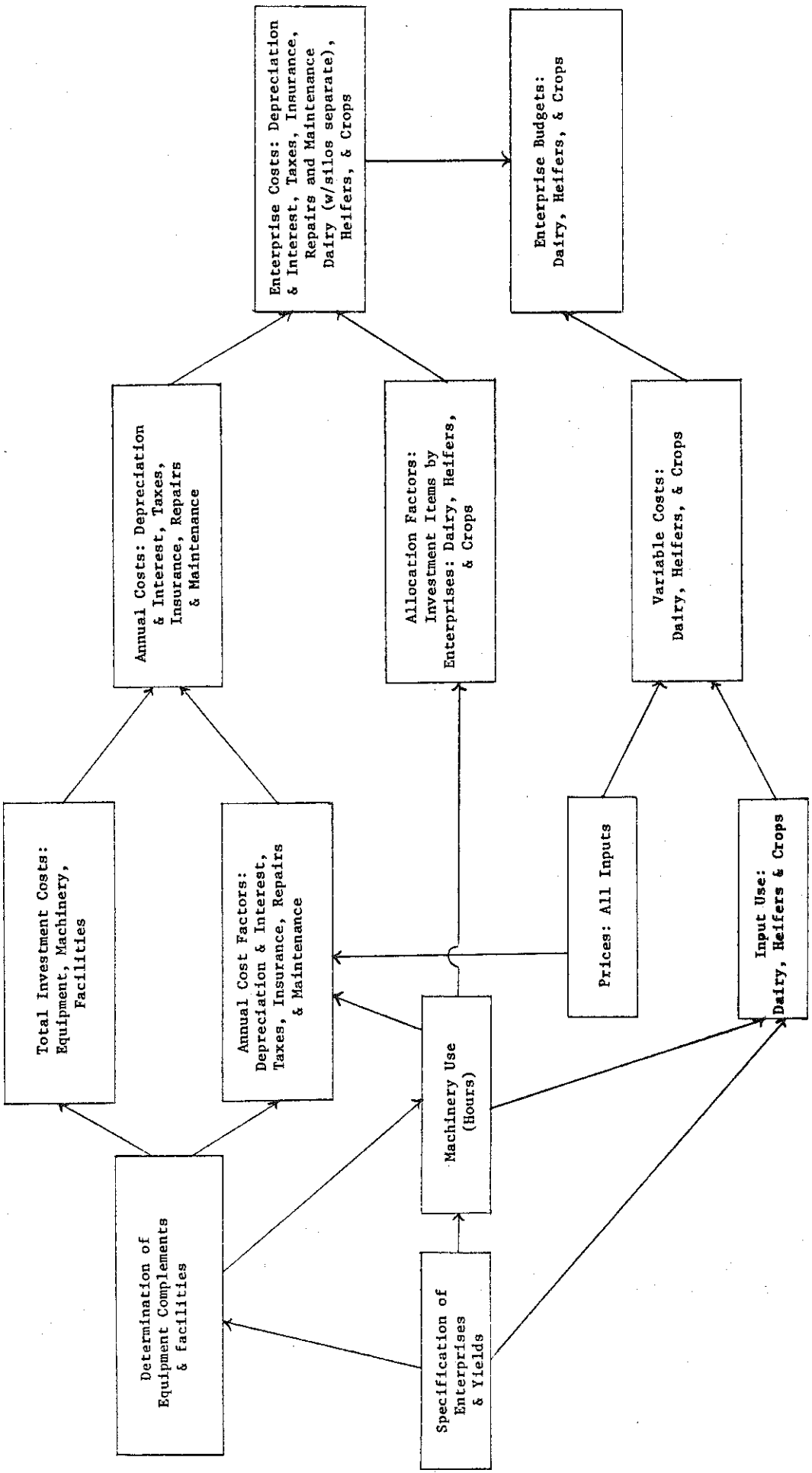
Field equipment, buildings and facilities (prices and construction costs) were collected or calculated and used to determine fixed and repair and maintenance costs. Input levels required to obtain the production response levels were specified. Prices and level of input usage were combined to provide variable costs.

Based on the enterprises included and their sizes, the facilities and equipment complements were specified. They were then allocated to enterprises on the basis of the amount each machine, building or piece of equipment was expected to be used by the enterprise. These values were then divided by the number of production units in the enterprise and entered in the budgets.

Fixed Costs

Dairy barn, feeding equipment and most of the milking system costs were derived from Hoglund. Extension publications (Adams) and informal surveys were also utilized. The feed storage systems were designed on the basis of the storage capacities needed to hold a 10-month (plus 10 percent surplus) supply of forage (assuming two months between first and last cutting). The field equipment was chosen in consultation with Cornell staff, with the objective of providing an efficient and well-matched equipment complement.

Figure 1. Flow Chart of Enterprise Budgeting Procedure.



The specifications of the buildings and power and equipment along with their 1977 investment costs are listed in Table 2.

The depreciation and interest, taxes, insurance, and repair and maintenance rates used to calculate annual investment and operating costs are listed in Table 3. The rates are from Hoglund, Conneman (1977), and Campbell (1973).

Long-term and short-term capital costs are 7 and 9 percent, respectively. The former was applied to real property, barns and their associated facilities, land and the milking parlor. All other investments were charged the short-term rate. The interest costs included in the depreciation and interest factor are one-half the rates quoted above to reflect a charge on one-half the initial investment costs.

Several of the facilities and pieces of equipment, e.g., the tractors and feed storage, are used by more than one enterprise. The annual costs for these were allocated among the enterprises by proportion of use by each enterprise. For forage storage, the costs were shared by the dairy cow and heifer herds in proportion to the amount of roughage stored for each. For machinery, an annual use index was computed for particular operations from the horsepower requirements and amount of time the machinery was expected to be used. Annual costs charged to an enterprise were allocated in proportion to the proportion of use in that enterprise (Table 4).

At this stage, the fixed costs were for the total acres or number of animals in the enterprises. The final step was to divide by the number of acres or head. The resulting fixed costs per production unit were then entered in the enterprise budgets.

Prices and Variable Costs

Most of the variable costs were calculated independent of the fixed cost calculation--the notable exceptions being labor, repair and maintenance, and fuel, oil, and grease costs, all of which depend on the equipment and technology used. Input use per acre or per animal was determined and 1977 prices were specified by consulting with agricultural economists, agronomists and animal scientists. The prices assumed are based on 1977 prices with adjustments of prices out-of-step with expected long-term trends (Table 5). In particular, feed prices had been affected by bumper grain crops in the Midwest and poor roughage harvests in the Northeast. Thus, the corn and soy prices were increased and roughage prices lowered from the prevailing 1977 levels. The relationships among the prices of other inputs and outputs are expected to be relatively stable.

Crop values were estimated from conversations with extension personnel in Northern New York and at Cornell. Roughage costs were based on dry hay prices. Grass hay prices are lower than mixed mainly legume hay, reflecting the quality differential. Purchased hay crop silage costs are the same as hay costs, on a dry matter basis, with an adjustment for different storage and feeding losses (Knoblauch, Milligan, and Woodell, p. 20). The corn silage price per ton is one-third that used for dry hay, a standard price relation based on their dry matter content. Prices received by farmers were used in the budgets both for sales off the farm and for transfers within the farm.

Table 2. Building and Power and Equipment Complements and 1977 Prices.

Facility/Equipment	Size or Capacity	Initial Investment
Barn; Structure, including concrete; Stalls; Water, plumbing, & wiring		$48,080
Barn, Field Equipment: 35' x 65' pole barn[b]		8,530
Barn, Heifer[c]		22,400
Bulk tank[a]		9,180
Cultivator[c]	4 row	1,425
Feed bunk[a]		3,040
Feed room[a]		3,680
Feeding equipment[d]		100
Fencing: 1 strand smooth wire; insulators; fencer, 1,446 posts; 14,460 ft.[e]		1,389
Forage harvester--heavy duty[f]		6,300
Pick-up head		1,200
Corn head	2 row	2,275
Forage wagons (2): 3 beaters, roof, & 10 T running gear[e]	16 ft.	7,630
Grain drill[f]	18-7 (10.5 ft.)	3,250
Grass seed attachment[f]		365
Livestock equipment (heifers)[c]		1,460
Manure spreader: with hydraulic endgate[f]	230 bu.	3,200
Mechanical conveying equipment[a]		3,610
Mechanical mixing wagon--tandem axles & hydraulic gate[e]	295 ft.^{3}	13,410
Milking parlor & system: double 4 herringbone[b]		30,000
Mower-conditioner[f]	7 ft.	4,400
Planter--plateless[f]	4 row	4,600
Plow[f]	4-16 in.	2,600
Side-delivery rake[f]		1,400
Silage blower[f]	54 in.	1,450
Silo, concrete and unloader[e,f]		
MML:[g] hay crop silage	30 x 80 ft.	30,990
2MML/1CS: hay crop silage	30 x 60 ft.	25,115
corn silage	22 x 60 ft.	16,315
1MML/2CS: hay crop silage	24 x 50 ft.	15,180
corn silage	26 x 75 ft.	25,110
G: hay crop silage	30 x 75 ft.	39,485
2G/1CS: hay crop silage	26 x 75 ft.	25,110
corn silage	24 x 50 ft.	15,060
Sprayer[e]		1,105
Spring-tooth harrow[f]	18 ft.	1,335
Storage, hay[b]	12 x 12 ft.	430
Tractors:	60 hp[f]	12,800
	80 hp	16,400
With loader & scraper[c]		11,500
Truck, pick-up[c]		5,650

Footnotes to Table 2.

a/ Based on Hoglund with adjustments for herd size and inflation.

b/ Based on Adams.

c/ Based on investment levels used in Knoblauch, Milligan, and Woodell.

d/ Shovels, forks, wheel barrows, carts, etc.

e/ From an informal survey of equipment dealers and extension agents.

f/ From Campbell (1977).

g/ These abbreviations refer to forages and have the following meanings: MML=mixed mainly legume, CS=corn silage, and G=grass. Combinations of hay crop silage and silage are indicated by the slash "/" symbol. For example, 2MML/1CS is 2 parts MML and 1 part CS, on a dry matter basis.

Table 3. Factors Used to Calculate Annual Costs for Facilities and Power and Equipment.

Facility/Equipment	Depreciation and Interest	Taxes[a/]	Insurance	Repairs and Maintenance
	---------Percent of Original Cost----------			
Barns & associated facilities	8.5	.875	1.5	2.0
Bulk tank	14.5	.875	1.5	4.0
Feed bunk	11.0	.875	1.5	3.0
Feeding equipment	24.5		1.5	5.0
Fencing	16.0	.875	1.5	8.0
Forage harvester attachments	17.0		1.5	6.0
Forage wagons	14.5		1.5	3.0
Land	7.0	1.75		
Livestock equipment (heifers)	13.0	.875	1.5	5.0
Manure spreader	16.0		1.5	10.0
Mechanical conveying equipment	17.0	.875	1.5	4.0
Mechanical mixing wagon	17.0		1.5	5.0
Milking equipment & parlor	12.7	.875	1.5	3.5
Mower-conditioner	14.5		1.5	5.5
Planter & drill	16.0		1.5	2.0
Plow	16.0		1.5	5.0
Side-delivery rake	16.0		1.5	2.0
Silage blower	17.0		1.5	5.0
Silo, concrete tower	9.5	.875	1.5	2.0
Silo unloader	17.0	.875	1.5	5.0
Sprayer	16.0		1.5	4.0
Spring-tooth harrow	16.0		1.5	1.5
Tractor: 50-80 hp	16.0		1.5	3.0
w/loader & scraper	16.0		1.5	4.0
Truck	12.5		1.5	10.0

[a/] Tax rate is equivalent to $1.75/$100 applied to one-half of the original cost.

Table 4. Allocation of Shares of Fixed Costs for Building and Power and Equipment Complements to Crop and Livestock Enterprises.

Facility/Equipment	Proportional Charges to Enterprises				
	Dairy Cow	Dairy Heifers	Hay Crop Silage	Corn Silage	Pasture
Barn, cow	1.0				
Barn, field equipment			.5	.5	
Barn, heifer		1.0			
Cultivator				1.0	
Feed bunk	1.0				
Feed room & feeding equipment	.75	.25			
Fencing					1.0
Forage harvester			.5	.5	
pick-up head			1.0		
2-row corn head				1.0	
Forage wagons			.5	.5	
Grain drill & grass seed attachment			1.0		
Hay storage		1.0			
Livestock equipment (heifers)		1.0			
Manure spreader	.75	.25			
Mechanical conveying equipment	.75	.25			
Mechanical mixing wagon	.75	.25			
Milking parlor & system; bulk tank	1.0				
Mower-conditioner			1.0		
Planter				1.0	
Plow			.25	.75	
Side-delivery rake			1.0		
Silage blower			.5	.5	
Silo, concrete and unloader	.8	.2			
Sprayer				1.0	
Spring tooth harrow			.25	.75	
Tractor:					
60 hp			.5	.5	
80 hp	.32	.02	.33	.33	
w/loader & scraper	.75	.25			
Truck	.3	.1	.3	.3	

Table 5. Product Prices and Input Costs Used in the Enterprise Budgets.

Item	Price, Value, or Cost	
	Selling	Buying
	----------$----------	
Capital		
Long-term		9%
Short-term		7%
Crops		
Corn		
High moisture ear corn: HMEC	57.25/T[a/] 2.37/bu,CEq[b/]	67.39/T 2.79/bu,CEq
Silage: CS	18.19/T	23.40/T
Oats		1.90/bu.
Dry hay		
Grass: G(DH)	45.00/T	60.00/T
Mixed mainly legume: MML(DH)	55.00/T	70.00/T
Hay crop silage		
Grass: G(DH)	19.29/T[c/]	25.40/T
Mixed mainly legume: MML(H)	23.57/T	29.60/T
Fertilizers		
Nitrogen: N		0.20/lb.
Phosphate: P_2O_5		0.16/lb.
Potassium: K_2O		0.10/lb.
Fuel, Diesel		0.50/gal.
Labor		3.50/hr.
Land		
Crop		450-575/A
Pasture		100/A
Lime		14.00/T (spread)
Milk and livestock		
Calves	35.00	
Cows and heifers	450-700	
Cull cows	286	
Milk	9.52/cwt.	
Seed		
Corn		40.00/80,000 seeds
Reed canary grass		2.25/lb.
Timothy		0.75/lb.
Trefoil		4.50/lb.

[a/] The prices quoted for tons of 30 percent moisture high moisture ear corn are derived from the assumed price of $2.37 per bushel of dry shelled corn grain. One bushel of shelled grain (at 15.5 percent moisture) was assumed to be equivalent to 82.8 pounds of HMEC. ($2.37/bu. ÷ 82.8 lb/bu.) x 2,000 lb/T = $57.25/T.

[b/] CEq stands for corn equivalent and HEq for hay equivalent.

[c/] Selling prices for hay crop silage are based on selling prices for dry hay, with differences in harvesting losses taken into account.

The labor charge of $3.50 per hour includes wages, social security, unemployment and accident insurance and any fringe benefits (e.g., free milk and beef) received by the workers. Land costs in Northern New York vary considerably depending on inherent productivity and market pressures in the locality. For the purposes of the budgets, the differences in value should reflect differences in productivity. The $450-575/A range seems typical of that expected within the area.

The milk and livestock values came from Knoblauch, Milligan and Woodell, conversations with Cornell staff (Chase, Story), extension personnel (Wasserman) and USDA reports. In general, livestock values were expected to be a little lower than in the rest of the state. The milk price is based on the average New York-New Jersey blend price for 1977, adjusted for distance from New York City and for 3.7 percent butterfat.

Use of the Enterprise Budgets

These enterprise budgets can serve as aids to decision-making for farmers, extension agents and others serving agriculture. They provide a variety of information useful in many areas from determining day-to-day operations to planning a complete reorganization of the farm enterprises. They provide a framework for farmers to construct their own sets of budgets. Indeed, these budgets cannot be accurate for each farm situation, but rather only the particular sets of equipment, resources and practices assumed. The budgets are representative of Northern New York, but any farmer should tailor them to his or her own farm by making appropriate adjustments in the costs, returns, yields and input levels.

With enterprise budgets tailored to the farm, alternative combinations of enterprises can be evaluated for their profitability, labor requirements or many other characteristics of farm organization and operation. "Profitable Organization of Dairy Farm Enterprises" (NEWPLAN Program 65) can be used to determine the most profitable combination of enterprises, given the land and labor resources of the farm and the costs and returns from the enterprises.

Enterprise budgets can also be used in investment analysis. Estimates of costs and returns with and without an investment can be compared to see if the net return covers the investment cost. These budgets could also be useful in examining a herd expansion. The Dairy Systems Analysis Handbook (Hoglund) and NEWPLAN Program 50, "Major Capital Investment Program" could also prove helpful.

In using the enterprise budgets, it is important to remember the implications of the procedures used. Costs are based on all new equipment prices and current prices of inputs. In reality, total costs are based on a mixture of current and past equipment prices and investment costs.

The enterprise budgets are projected costs and values of production using a particular complement of technologies, normalized price relationships and all new investments. The results are not expected to be current averages for Northern New York. For those who wish to apply these budgets to other farms, it is suggested that actual costs be substituted for those in the budgets as much as possible. The budgets should act as guidelines for format and cost range.

CROP ENTERPRISE BUDGETS

The crop enterprises are divided into two groups--forages and grains--and include the following crop enterprises (numbers in parentheses are percent dry matter):

Forages
- Grass hay (90)
- Mixed mainly legume hay (90)
- Grass hay crop silage (40)
- Mixed mainly legume hay crop silage (40)
- Pasture
- Corn silage (30)

Grains
- High moisture ear corn (70)
- Oats (88)

The budgets for the forage enterprises are based on 100 acres each of hay crop and corn silage. The grain enterprises are not a part of the initial resource set and are constructed using assumptions specified in the grain crops section of the enterprise budgets.

For all crops but pasture, enterprise budgets are available for three or four yield levels. This range of yields covers the varying soil resources of Northern New York and illustrates potential relationships between input and output levels. In general, as yields rise, input levels also rise, but less than proportionately. The yields are out-of-field, that is, they are for quantities placed in storage or sold. The costs are calculated assuming the crops are fed to livestock on the farm. If the crops are to be sold, additional costs for drying, marketing and/or transporting should be added. In addition, hay crops harvested as a silage for on-farm use would probably be baled if they were sold, incurring additional harvest losses and so reducing the yields. The costs in the crop enterprise budgets include transporting the crop to storage; storage costs are charged to the livestock enterprises.

Individual users should substitute their own costs when they are known. Input and output prices are in Table 5 and specific assumptions of the crop budgets are in the appended footnotes.

The headings of the budgets state the crop enterprises to which they apply. Each page of budgets has three or four budgets for different yield levels of the crop. Region and enterprise code numbers for use in NEWPLAN programs are at the top, along with the production levels. The budgets are organized in five sections, as follows:

- Income
- Variable expenses
- Fixed expenses
- Total fixed and variable expenses
- Feed equivalents produced

Income consists of value of production and gross income per acre. Selling prices and yield are used to compute the per acre value of production. In the case of hay crop silage, the selling price is based on the hay price adjusted for dry matter content and for storage and feeding loss differences. Because crop production is intended to supply the livestock enterprise rather than to be sold, no gross income (off-farm sales) is indicated.

The variable expenses are itemized. Fuel, oil and grease are for all machinery used in producing the crop, including tillage, planting, fertilizing, spraying and harvesting. Repairs and maintenance cover the same set of equipment, with costs shared among crop enterprises according to the use each gets from a machine (Table 4). For seed, fertilizer, manure, lime and labor, quantities used per acre are also given. Seed, fertilizer, lime and manure rates are in accordance with Cornell Recommends for Field Crops. Herbicide costs occur in some budgets. Interest on operating expenses (nine percent) is computed on the assumption that the money spent on inputs and labor will be tied up an average of six months between planting and harvesting of the crop. The subtotal for selected variable expenses is calculated for use in NEWPLAN programs. All labor, both family and hired, is charged at the rate of $3.50 per hour.

The fixed expenses include the usual ownership costs of land, facilities and equipment. The fixed expenses consist of depreciation and interest, insurance and taxes (Table 4). Depreciation and interest were aggregated into four categories: power and equipment, truck, buildings and land. The building is an equipment barn which includes a shop and provides space for parking all machinery. Property tax was charged at $1.75 per $1,000 of value on real property--land, buildings and fixed equipment. Values of all investments except land are at one-half the initial cost. Moveable machinery and equipment were not taxed. Insurance was charged on all livestock, machinery, equipment, and buildings.

Feed equivalent produced provides a standardized measure of production. Forage yields are expressed as equivalent amounts of hay, on a hay equivalent (90 percent dry matter) basis. Grain yields are converted to bushels of corn grain equivalents on the basis of energy contents. These are the amounts of feed available for transfer to the livestock enterprises.

ENTERPRISE BUDGETS

FOR FORAGE CROPS

G R A S S

Region Code = 3

Enterprise[a]	Grass Hay Fed		Grass Hay Fed		Grass Hay Fed	
Production Level	High		Average		Low	
Enterprise Code Number	01		02		03	
INCOME:						
Yield Per Acre, T.		3.0		2.3		1.5
Price, $/T.		45.00		45.00		45.00
Value of Production		$135.00		$103.50		$ 67.50
1[b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Seed:						
Timothy, lb.	(9)[e]	1.69	(8)	1.50	(7)	1.30
Fertilizer:						
Nitrogen, lb.	(30)	6.00	(20)	4.00	(15)	3.00
Phosphorus, P_2O_5 lb.	(25)	4.00	(20)	3.20	(15)	2.40
Potassium, K_2O lb.	(25)	2.50	(20)	2.00	(15)	1.50
Manure, Lime	(8,0)	--	(6,0)	--	(4,0)	--
Herbicide		--		--		--
Power and Equipment:						
Fuel, Oil, Grease[c]		4.76		3.15		2.82
Repairs & Maintenance[d]		13.34		13.34		13.34
Twine[f]		2.90		2.40		1.40
Other[g]		4.25		3.90		3.50
Interest on Operating Expenses[h]		$ 1.77		$ 1.51		$ 1.32
2 Total Selected Variable Expenses		$ 41.21		$ 35.00		$ 30.58
4 Family & Hired Labor, Hours	(11.8)[i]	41.30	(10.5)	36.75	(8.5)	29.75
Total Variable Expenses		$ 82.51		$ 71.75		$ 60.33
FIXED EXPENSES:						
Power & Equipment[j]		47.52		47.52		47.52
Truck		2.12		2.12		2.12
Building Use		3.63		3.63		3.63
Land Charge[k]		35.00		33.39		31.50
Property Tax[l]		9.13		8.73		8.26
Insurance[d]		5.45		5.45		5.45
Total Fixed Expenses		$102.85		$100.84		$ 98.48
TOTAL VARIABLE & FIXED EXPENSES[m]		$185.36		$172.59		$159.81
FEED EQUIVALENT PRODUCED:						
Hay Equivalent, T.		3.0		2.3		1.5

Footnotes are on page 22.

G R A S S

Region Code = 3

Enterprise[a]	Hay Crop Silage Fed		Hay Crop Silage Fed		Hay Crop Silage Fed	
Production Level	High		Average		Low	
Enterprise Code Number	06		07		08	
INCOME:						
Yield Per Acre, T.		7.0		5.4		3.5
Price, $/T.		19.29		19.29		19.29
Value of Production		$135.03		$104.17		$ 67.52
1[b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Seed:						
Timothy, lb.	(9)[e]	1.69	(8)	1.50	(7)	1.31
Fertilizer:						
Nitrogen, lb.	(30)	6.00	(20)	4.00	(15)	3.00
Phosphorus, P_2O_5 lb.	(25)	4.00	(20)	3.20	(15)	2.40
Potassium, K_2O lb.	(25)	2.50	(20)	2.00	(15)	1.50
Manure, Lime	(12,0)	--	(8,0)	--	(4,0)	--
Herbicide		--		--		--
Power and Equipment:						
Fuel, Oil, Grease[c]		5.16		3.48		2.94
Repairs & Maintenance[d]		13.94		13.94		13.94
Twine[f]		--		--		--
Other[g]		3.75		3.40		3.00
Interest on Operating Expenses[h]		$ 1.67		$ 1.42		$ 1.26
2 Total Selected Variable Expenses		$ 38.71		$ 32.94		$ 29.35
4 Family & Hired Labor, Hours	(8.0)[i]	28.00	(7.6)	26.60	(7.0)	24.50
Total Variable Expenses		$ 66.71		$ 59.54		$ 53.85
FIXED EXPENSES:						
Power & Equipment[j]		49.06		49.06		49.06
Truck		2.12		2.12		2.12
Building Use		3.63		3.63		3.63
Land Charge[k]		35.00		33.39		31.50
Property Tax[l]		9.13		8.73		8.26
Insurance[d]		5.64		5.64		5.64
Total Fixed Expenses		$104.58		$102.57		$100.21
TOTAL VARIABLE & FIXED EXPENSES[m]		$171.29		$162.11		$154.06
FEED EQUIVALENT PRODUCED:						
Hay Equivalent, T.		3.1		2.4		1.6

Footnotes are on page 22.

MIXED MAINLY LEGUME

Region Code = 4

Enterprise[a]	Mixed Mainly Legume Hay Fed		Mixed Mainly Legume Hay Fed		Mixed Mainly Legume Hay Fed	
Production Level	High		Average		Low	
Enterprise Code Number	01		02		03	
INCOME:						
Yield Per Acre, T.		4.5		3.0		1.5
Price, $/T.		55.00		55.00		55.00
Value of Production		$247.50		$165.00		$ 82.50
1[b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Seed:						
Timothy, lb.	(6)[e]	1.13	(5)	0.94	(4)	0.75
Trefoil, lb.	(8)	9.00	(7)	7.88	(6)	6.75
Fertilizer:						
Nitrogen, lb.		--		--		--
Phosphorus, P_2O_5 lb.	(70)	11.20	(40)	6.40	(20)	3.20
Potassium, K_2O lb.	(75)	7.50	(50)	5.00	(25)	2.50
Manure, Lime	(0,0.5)	7.00	(0,0.3)	4.62		--
Herbicide		--		--		--
Power and Equipment:						
Fuel, Oil, Grease[c]		5.30		4.76		2.82
Repairs & Maintenance[d]		13.34		13.34		13.34
Twine[f]		4.30		2.90		1.40
Other[g]		5.00		4.25		3.50
Interest on Operating Expenses[h]		$ 2.87		$ 2.25		$ 1.54
2 Total Selected Variable Expenses		$ 66.64		$ 52.34		$ 35.80
4 Family & Hired Labor, Hours	(12.5)[i]	43.75	(11.8)	41.30	(8.5)	29.75
Total Variable Expenses		$110.39		$ 93.64		$ 65.55
FIXED EXPENSES:						
Power & Equipment[j]		47.52		47.52		47.52
Truck		2.12		2.12		2.12
Building Use		3.63		3.63		3.63
Land Charge[k]		38.50		35.00		31.50
Property Tax[l]		10.01		9.13		8.26
Insurance[d]		5.45		5.45		5.45
Total Fixed Expenses		$107.23		$102.85		$ 98.48
TOTAL VARIABLE & FIXED EXPENSES[m]		$217.62		$196.49		$164.03
FEED EQUIVALENT PRODUCED:						
Hay Equivalent, T.		4.5		3.0		1.5

Footnotes are on page 22.

M I X E D M A I N L Y L E G U M E

Region Code = 4

Enterprise[a]	Mixed Mainly Legume Hay Crop Silage		Mixed Mainly Legume Hay Crop Silage		Mixed Mainly Legume Hay Crop Silage	
Production Level	High		Average		Low	
Enterprise Code Number	06		07		08	
INCOME:						
Yield Per Acre, T.		10.5		7.0		3.5
Price, $/T.		23.57		23.57		23.57
Value of Production		$247.49		$164.99		$ 82.50
1[b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Seed:						
Timothy, lb.	(6)[e]	1.13	(5)	0.94	(4)	0.75
Trefoil, lb.	(8)	9.00	(7)	7.88	(6)	6.75
Fertilizer:						
Nitrogen, lb.		--		--		--
Phosphorus, P_2O_5 lb.	(70)	11.20	(40)	6.40	(20)	3.20
Potassium, K_2O lb.	(75)	7.50	(50)	5.00	(25)	2.50
Manure, Lime	(0,0.5)	7.00	(0,0.3)	4.62		--
Herbicide		--		--		--
Power and Equipment:						
Fuel, Oil, Grease[c]		7.30		5.16		2.93
Repairs & Maintenance[d]		13.94		13.94		13.94
Twine[f]		--		--		--
Other[g]		4.50		3.75		3.00
Interest on Operating Expenses[h]		$ 2.77		$ 2.15		$ 1.49
2 Total Selected Variable Expenses		$ 64.34		$ 49.84		$ 34.56
4 Family & Hired Labor, Hours	(8.5)[i]	29.75	(8.0)	28.00	(7.0)	24.50
Total Variable Expenses		$ 94.09		$ 77.84		$ 59.06
FIXED EXPENSES:						
Power & Equipment[j]		49.06		49.06		49.06
Truck		2.12		2.12		2.12
Building Use		3.63		3.63		3.63
Land Charge[k]		38.50		35.00		31.50
Property Tax[l]		10.01		9.13		8.26
Insurance[d]		5.64		5.64		5.64
Total Fixed Expenses		$108.96		$104.58		$100.21
TOTAL VARIABLE & FIXED EXPENSES[m]		$203.05		$182.42		$159.27
FEED EQUIVALENT PRODUCED:						
Hay Equivalent, T.		4.7		3.1		1.6

Footnotes are on page 22.

		Region Codes = 3,4
Enterprise[a]		Pasture
Production Level		Average
Enterprise Code Number		12
INCOME:		
Yield Per Acre, T.		1.0
Price, $/T.		30.00
Value of Production		$ 30.00
1[b] Gross Income (Off-Farm Sales)		$ 0.00
VARIABLE EXPENSES:		
Seed:		
Reed Canary Grass, lb.	(8)[e]	1.80
Fertilizer:		
Nitrogen, lb.		--
Phosphorus, P_2O_5 lb.		--
Potassium, K_2O lb.		--
Manure, Lime	(4,0)	--
Herbicide		--
Power and Equipment:		
Fuel, Oil, Grease[c]		1.15[n]
Repairs & Maintenance[d]		1.48
Twine[f]		--
Other[g]		--
Interest on Operating Expenses[h]		$ 0.20
2 Total Selected Variable Expenses		$ 4.63
4 Family & Hired Labor, Hours	(1)[i]	3.50
Total Variable Expenses		$ 8.13
FIXED EXPENSES:		
Power & Equipment[j]		--
Truck		--
Building Use		--
Land Charge[k]		10.84
Property Tax[l]		1.91
Insurance[d]		0.28
Total Fixed Expenses		$ 13.03
TOTAL VARIABLE & FIXED EXPENSES[m]		$ 21.16
FEED EQUIVALENT PRODUCED:		
Hay Equivalent, T.		1.0

Footnotes are on page 22.

Region Codes = 3,4

Enterprise[a]	Corn Silage Fed		Corn Silage Fed		Corn Silage Fed		Corn Silage Fed	
Production Level	Very High		High		Average		Low	
Enterprise Code Number	17		18		19		20	
INCOME:								
Yield Per Acre, T.		18		16		12		8
Price, $/T.		18.19		18.19		18.19		18.19
Value of Production		$327.42		$291.04		$218.28		$145.52
1[b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:								
Seed:								
Corn, lb.	(28,000)[e]	15.56	(26,000)	14.44	(24,000)	13.33	(22,000)	12.22
Fertilizer:								
Nitrogen, lb.	(120)	24.00	(95)	19.00	(70)	14.00	(45)	9.00
Phosphorus, P_2O_5 lb.	(65)	10.40	(45)	7.20	(30)	4.80	(30)	4.80
Potassium, K_2O lb.	(55)	5.50	(45)	4.50	(35)	3.50	(35)	3.50
Manure, Lime	(18,0)	--	(16,0)	--	(12,0)	--	(8,0)	--
Herbicide		10.00		10.00		8.00		6.00
Power and Equipment:								
Fuel, Oil, Grease[c]		5.04		4.60		4.02		3.63
Repairs & Maintenance[d]		13.93		13.93		13.93		13.93
Other[g]		5.50		4.75		4.00		3.25
Interest on Operating Expenses[h]		$ 4.05		$ 3.53		$ 2.95		$ 2.53
2 Total Selected Variable Expenses		$ 93.98		$ 81.95		$ 68.53		$ 58.86
4 Family & Hired Labor, Hours	(8.8)[i]	30.80	(8.5)	29.75	(8.2)	28.70	(7.8)	27.30
Total Variable Expenses		$124.78		$111.70		$ 97.23		$ 86.16
FIXED EXPENSES:								
Power & Equipment[j]		50.12		50.12		50.12		50.12
Truck		2.12		2.12		2.12		2.12
Building Use		3.62		3.62		3.62		3.62
Land Charge[k]		40.25		38.50		35.00		31.50
Property Tax[l]		10.43		10.00		9.12		8.25
Insurance[d]		5.95		5.95		5.95		5.95
Total Fixed Expenses		$112.49		$110.31		$105.93		$101.56
TOTAL VARIABLE & FIXED EXPENSES[m]		$237.27		$220.01		$203.16		$187.72
FEED EQUIVALENT PRODUCED:								
Hay Equivalent, T.		6.0		5.3		4.0		2.7

Footnotes are on page 22.

Footnotes for Crop Budgets

a/ Based on equipment complements and input prices from Tables 2 - 5 and the practices described in the text. Hay crop and corn silage enterprises are 100 acres in size, and pasture 75 acres.

b/ The numbers in the left-hand margin refer to data entry line numbers for Profitable Organization of Dairy Farm Enterprises (NEWPLAN 65).

c/ Calculated using the economic engineering method.

d/ Determined from Tables 2, 3, and 4.

e/ The number in parentheses are amounts of inputs used. Seed quantities are from Cornell Recommends for Field Crops. Fertilizer, manure, and lime applications and herbicide costs were set in consultation with extension agents and agronomists in Northern New York and at Cornell. Fertilizer, lime, and manure application rates are annual averages, seed rates are per seeding.

f/ Based on Knoblauch, Milligan and Woodell.

g/ Estimations based on Snyder (1977b), Bratton (1978a), and Knoblauch, Milligan and Woodell.

h/ Charged on operating capital for 6 months at 9 percent annual rate.

i/ Labor use per acre is calculated from Knoblauch, et al. (1978) page 2 adjusting for yield level. The resulting figures represents labor disappearance, not hours of machinery use.

j/ The entries for power and equipment, truck, and building use are for depreciation and interest costs. Cost factors and initial values are listed in Tables 2, 3 and 4. Interest is charged on one-half of the initial value at 7 percent for real property and 9 percent for other items.

k/ Interest cost based on the land value, charged at 7 percent.

l/ Applied to real property at $1.75 per $1,000 of value. Current value is used for land and 1/2 the initial value is used for other real property.

m/ This estimate of costs is based on the practices and equipment complements specified, with input and investment prices at their 1977 levels. It is not the average cost of production of the crop in Northern New York. It does reflect the relative costs of different crops when the budgets are used as a set.

n/ For spreading manure.

Forage Crops

The forage crops form the base of the cropping system. Two hundred crop acres are equally divided between a hay crop and corn silage. Hay crop silage and dry hay budgets are both included.

Two hay crops are included, a grass and a mixed mainly legume. The grass is timothy and the mixed mainly legume is timothy and birdsfoot trefoil. The main differences are in nutritional quality. On a dry matter basis, the grass is 10.2 percent protein and 0.47 Mcal/lb. of net energy. For the mixed mainly legume, the nutrient values are 14 percent protein and 0.54 Mcal/lb. (Table 6, page 33). Yields also differ primarily because an additional cutting of mixed mainly legume is often possible.

Dry Hay

Variable expenses increase with yield, though less than proportionately. At similar yield levels, they are slightly higher for the mixed mainly legume largely due to larger seed expense. Seed quantities are those used in establishment. With a four-year life of the stand, budget values are average annual cost. Fertilizer applications differ between the year of establishment and other years. The rates and costs noted are annual averages. Nitrogen and/or manure are applied on the grass; lime is applied on the legume.

The field equipment and storage facilities for dry hay are different than those for hay crop silage specified in the budget contruction section. Investment costs for a dry hay enterprise for a farm with 80 cows and associated replacements using dry hay as the only roughage source are adjusted to reflect the purchase of baler ($5,250).

Since the same set of machinery is used at all yield levels, fixed expenses are constant across yield levels except for those relating to the value of the land. Land value increases are associated with yields, so property taxes and land charges increase concurrently with yields.

Total fixed and variable expenses exceed the value of production except for high-yielding mixed mainly legume hay. This result illustrates the importance of introducing legumes into the hay crop and of managing for high yields.

Hay Crop Silages

The differences between the hay and hay crop silage budgets are due to different harvesting methods. Up to harvesting, practices and in-field yields are identical. However, harvesting losses are different and result in greater harvested yield of dry matter with hay crop silage (Knoblauch, Milligan and Woodell). Labor costs are lower for the silage and there is no charge for twine. Overall, the expense-return relationship is slightly more favorable for the hay crop silages.

Feed equivalents are found by determining the amount of hay (90 percent dry matter) which would have the same dry matter as the hay crop silage (40 percent dry matter) which was harvested. This is accomplished by dividing hay crop silage yields by 2.25.

Pasture

The role of the pasture in the farm resource specification is small. The labor requirement is very low. The only operations are seeding, which is done once every ten years, and spreading manure. The pasture budget was constructed assuming 75 acres of pasture. It is a slightly improved pasture, having been seeded with reed canary grass and receiving applications of manure. The land is not suited for growing field crops. The cost per acre is low, as is the production. The major cost is for the land and fencing.

Corn Silage

Corn silage budgets are available for four yield levels: 8, 12, 16 and 18 tons/acre. The price specified is a third of the dry hay price, a rule of thumb based on the dry matter contents. Again gross income is zero, because the crop is expected to be used to feed the farm's livestock. Although values (per ton of dry matter) of the hay crops and corn silage are similar, the value of production of corn silage is much higher, because of the higher dry matter yields, as shown by the feed equivalents produced.

Relative to the hay crops, corn silage has higher variable costs. The major increases are in fertilizer and seed costs. Also, herbicides are used. Labor requirements are slightly lower than for the dry hays, and similar to those for the hay crop silages. Variable expenses increase substantially with yields due to increased input levels.

Fixed expenses tend to be slightly higher for the corn silage than for the hay crops. Added to the variable expenses, they raise the total cost per acre higher than for the hay crops; however, the higher yields and values of production more than compensate for this, leaving a positive return to management for corn silage at all but the lowest yield levels. This difference between total cost and value of production is sensitive to changes in the prices assumed. The prices used for all forages are based on dry hay selling prices and dry matter contents. Differences in nutrient qualities, transportability and use of the crop would alter their values.

ENTERPRISE BUDGETS

FOR GRAIN CROPS

Region Code = 3,4

Enterprise[a] / Production Level	High Moisture Ear Corn Very High		High Moisture Ear Corn High		High Moisture Ear Corn Average		High Moisture Ear Corn Low	
Enterprise Code Number	27		28		29		30	
INCOME:								
Yield Per Acre, T.		4.1		3.3		2.5		1.7
Price, $/T.		57.25		57.25		57.25		57.25
Value of Production		$234.72		$188.92		$143.12		$ 97.32
1 [b] Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:								
Seed:								
Corn	(25,000)[e]	13.89	(23,000)	12.78	(21,000)	11.67	(19,000)	10.56
Fertilizer:								
Nitrogen, lb.	(120)	24.00	(95)	19.00	(70)	14.00	(45)	9.00
Phosphorus, P_2O_5 lb.	(65)	10.40	(45)	7.20	(30)	4.80	(30)	4.80
Potassium, K_2O lb.	(55)	5.50	(45)	4.50	(35)	3.50	(35)	3.50
Manure, Lime	(18,0)	--	(16,0)	--	(12,0)	--	(8,0)	--
Herbicide		10.00		10.00		10.00		10.00
Power and Equipment:								
Fuel, Oil, Grease[c]		4.82		4.65		4.43		4.29
Repairs & Maintenance[d]		17.36		17.36		17.36		17.36
Other[f]		5.00		4.25		3.50		2.75
Interest on Operating Expenses[h]		4.09		3.59		3.03		2.62
2 Total Selected Variable Expenses		$ 95.06		$ 83.33		$ 70.29		$ 60.88
4 Family & Hired Labor, Hours	(5.9)[i]	20.65	(5.6)	19.60	(5.4)	18.90	(5.2)	18.20
Total Variable Expenses		$115.71		$102.93		$ 89.19		$ 79.08
FIXED EXPENSES:								
Power & Equipment[j]		59.85		59.85		59.85		59.85
Truck		2.12		2.12		2.12		2.12
Building Use		3.62		3.62		3.62		3.62
Land Charge[k]		40.25		38.50		35.00		31.50
Property Tax[l]		10.43		10.00		9.12		8.25
Insurance[d]		6.81		6.81		6.81		6.81
Total Fixed Expenses		$123.08		$120.90		$116.52		$112.15
TOTAL VARIABLE & FIXED EXPENSES[m]		$238.79		$223.83		$205.71		$191.23
FEED EQUIVALENT PRODUCED:								
Corn Equivalent, bu./A		99		80		60		41

Footnotes are on page 22.

Region Code = 3,4

Enterprise	Oats Fed		Oats Fed		Oats Fed	
Production Level	High		Average		Low	
Enterprise Code Number	32		33		34	
INCOME:						
Yield Per Acre, bu.		80		60		40
Price, $/bu.		$ 1.90		$ 1.90		$ 1.90
Value of Production		$152.00		$114.00		$ 76.00
1 [b] GROSS INCOME (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Growing						
Seed, bu.	(2.75)	$ 10.90	(2.5)	$ 9.90	(2.25)	$ 8.90
Fertilizer:						
Nitrogen, lb.	(45)	9.00	(35)	7.00	(25)	5.00
Phosphorus, P_2O_5 lb.	(40)	6.40	(35)	5.60	(30)	4.80
Potassium, K_2O lb.	(70)	7.00	(50)	5.00	(30)	3.00
Manure, Lime, Cover Crop		2.00		2.00		2.00
Herbicide, Other Chemicals		1.00		1.00		0.00
Power and Equipment:						
Fuel, Oil, Grease [c]		1.90		1.90		1.65
Repairs & Maintenance		3.00		3.00		2.70
Other		2.00		2.00		1.50
Total Growing Cost		$ 43.20		$ 37.40		$ 29.55
Harvesting						
Power and Equipment:						
Fuel, Oil, Grease [c]		$ 0.15		$ 0.11		$ 0.08
Repairs & Maintenance		0.00		0.00		0.00
Other:						
Custom Combine		$ 17.00		$ 17.00		$ 17.00
Total Harvesting Cost		$ 17.15		$ 17.11		$ 17.08
Selling						
Truck, Tractor & Equipment		$ 0.00		$ 0.00		$ 0.00
Drying and Marketing		0.00		0.00		0.00
Other		0.00		0.00		0.00
Total Selling Cost		$ 0.00		$ 0.00		$ 0.00
Interest on Operating Expenses [h]		$ 2.72		$ 2.45		$ 2.10
2 Total Selected Variable Expenses		$ 63.07		$ 56.96		$ 48.73
4 Family & Hired Labor, Hours [i]	(3.3)	$ 11.55	(3.1)	$ 10.85	(3.0)	$ 10.50
Total Variable Expenses		$ 74.62		$ 67.81		$ 59.23
FIXED EXPENSES:						
Power & Equipment [f]		$ 28.65		$ 28.65		$ 27.90
Truck		1.40		1.40		1.40
Interest (Power, Equipment, Truck)		20.96		20.96		20.46
Building Use		3.65		3.65		3.65
Land Charge (Value/Acre) [k]	(500)	35.00	(400)	28.00	(300)	21.00
Property Tax [l]		8.75		7.00		5.25
Insurance		6.14		6.14		5.97
Total Fixed Expenses		$104.55		$ 95.80		$ 85.63
TOTAL VARIABLE & FIXED EXPENSES [m]		$179.17		$163.61		$144.86
FEED EQUIVALENT PRODUCED:						
Corn Equivalent, bu.		40.8		30.6		20.4

Footnotes are on page 22.

Grain Crops

The resource set specified for the forages assumed that only forage enterprises are included. Many farms in Northern New York also produce some or all of their grain requirements; consequently, high moisture ear corn and oat budgets are included. The fixed expenses were calculated as described below. Other procedures are the same as for forage crops.

High Moisture Ear Corn

Enterprise budgets were constructed for 4.1, 3.3, 2.5, and 1.7 tons of high moisture ear corn (30 percent moisture). These yields are equivalent to 99, 80, 60, and 41 bushels of dry shelled corn. The cultural methods are the same as for corn silage, except that planting rates are lower. The applicable per acre machinery costs were assumed to be the same as for corn silage. The high moisture ear corn is harvested with a two-row snapper head on the forage harvester; to calculate fixed expenses the additional cost of the snapper head ($4,000) was allocated on the basis of 50 acres of corn grain.

The values of production are higher than for any other crop. The price was based on a price of $2.37 per bushel of shelled corn.[1/] This price reflects the option of a farmer to sell the corn, otherwise known as the opportunity cost.

Lower fuel and labor costs and higher repair costs are the main differences between the variable expenses of the grain and silage budgets. Harvesting only the ears rather than whole plants reduces fuel and labor costs; however, repair costs are higher because the snapper head adds another item to repair. The variable expenses would be very similar for dry or high moisture shelled corn.

The fixed expenses reflect excess capacity of the snapper head. The equipment complement is adequate for an enterprise 1-1/2 or 2 times the stated size, which would spread costs over a larger area and reduce the cost borne by each acre. Fixed expense would be altered for other methods of harvest by the difference in investment in harvesting equipment.

Oats

The procedures used for the oat budgets were essentially the same. Three budgets were prepared for 15 acre oat enterprises with yields of 80, 60, and 40 bushels per acre. Values of production are based only on the grain. The straw is not given a value. If oats are, in fact, being grown for the straw, as well, then some value should be added.

Growing expenses increase with yield because of higher input levels. Harvesting expenses are virtually identical because the crop is custom combined at a flat rate per acre, rather than on the basis of bushels harvested.

[1/] The value of the corn grain may be converted from a bushel to a ton basis as follows:

$2.37/bu. x 24.15 bu. grain/T high moisture ear corn = $57.24/T high moisture ear corn.

In the fixed expenses, the items for power and equipment and truck are for depreciation only. Interest is charged as a separate item. The equipment complements are assumed to be the same, regardless of yield, except for the sprayer, which is not used in the low yield budget.

Total expenses rise somewhat with higher yields, but proportionately less than the yields. Expenses exceed the value of production, but the differences are smaller at higher yields. As in all the budgets here, the expenses and returns apply to the practices and technologies specified.

DAIRY LIVESTOCK BUDGETS

Dairy cow enterprise budgets were constructed for four production levels: 10, 13, 16, and 18,000 lbs./cow/year and two types of hay crops: grass (G) and mixed mainly legume (MML). Dairy heifer budgets for the two types of hay crop were also constructed. The format is similar to that of the crop budgets, with five sections: income, variable expenses, fixed expenses, total fixed and variable expenses, and grown feed requirements. Within the sections costs are itemized.

Assumptions About Practices and Kinds of Technologies Used

The dairy livestock enterprises are assumed to have the equipment and facilities noted in Tables 2 and 4. The herd is housed in an unheated freestall barn with capacity for 80 cows. The ration is prepared in a mechanical mixing wagon from the roughage, corn grain, soybean oil meal and the minerals listed in Table 6. Roughages are stored in upright concrete stave silos. Manure is scraped and spread daily. The milking system is a double four herringbone parlor and a bulk tank. Milking is done twice daily.

Ration Formulation

A least cost balanced ration is formulated for each production level and roughage composition (vanLieshout, et al.). In order to tailor the rations to Northern New York, feed analysis records for Clinton, Franklin and St. Lawrence Counties from the New York Dairy Herd Improvement Cooperative (NYDHIC) laboratory are used as the basis for specifying nutrient contents of the forages (Table 6). As indicated earlier, forages are grown on the farm while concentrates, including corn grain and soybean oil meal, are purchased.

Rations were formulated for three roughage compositions: all hay crop, two-thirds hay crop and one-third corn silage on a dry matter basis, and one-third hay crop and two-thirds corn silage. A higher proportion of corn silage in the roughage is unlikely given the corn growing capabilities of Northern New York soils. Rations were formulated with the following forage mixtures:

Grass hay crop silage	G(H)
Two parts grass hay crop silage and one part corn silage	2G/1CS
Mixed mainly legume hay crop silage	MML(H)
Two parts mixed mainly legume hay crop silage and one part corn silage	2MML/1CS
One part mixed mainly legume hay crop silage and two parts corn silage	1MML/2CS

No rations were formulated using one-third grass silage and two-thirds corn silage because farms which are restricted to grass hay crops would not likely be able to grow more corn than is used in a one-third corn silage ration.

Annual feed requirements for the four production levels were determined by specifying ten monthly (30.5 days) production levels[1/] and a sixty day dry period.[2/] No rations with grass were formulated at the 18,000 pound per year level because it was believed that 18,000 pounds is unrealistic with roughage this low in nutrients.

1/ S. B. Nott, Frank J. Sargent, and W. C. Search, Monthly Dairy Herd Growth, Users' Manual to Telplan Program 42, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan. Percent of total milk produced in each month of lactation is as follows: Month 1, 13.3%; month 2, 13.9%; month 3, 12.2%; month 4, 11.5%; month 5, 10.3%; month 6, 9.7%; month 7, 8.6%; month 8, 8.2%; month 9, 6.8%; month 10, 5.5%.

2/ During the second and third month at high production levels the minimum fiber level was reduced to as low as thirteen percent, which is acceptable for short periods (Chase).

Table 6. Nutrient Compositions of Feeds Used to Formulate Least Cost Balanced Rations.

Feed Name	Cost	Moisture	Net Energy[a/] (Lact.)	Protein	Fiber	Calcium	Phos-phorus	Mag-nesium	Salt
	$/cwt.	% H_2O	Mcal/lb. DM	Percent Dry Matter					
Sh. Corn	4.90	15.00	.95	10.2	2.4	0.02	.26	.12	0
Soybean Meal	9.50	10.00	.87	50.8	6.0	.29	.64	.28	0
DiCal	18.00	0	0	0	0	26.50	20.00	0	0
Mono Phos.	40.00	0	0	0	0	0	22.00	0	0
Lime	2.00	0	0	0	0	0	38.30	0	0
Salt	5.00	0	0	0	0	0	0	0	99.9
Mg. Ox.	18.00	0	0	0	0	0	0	54.00	0
MML (DH)	3.25	10.00	.54	14.00	30.50	1.04	.24	.27	0
MML (H)	1.33	60.00	.54	14.00	30.50	1.04	.24	.27	0
2MML/1CS	1.16	64.00	.58	12.12	28.16	.77	.22	.25	0
1MML/2CS	1.07	67.00	.63	10.18	25.74	.50	.20	.22	0
CS	1.00	70.00	.67	8.30	23.40	.23	.18	.20	0
G(DH)	2.50	10.00	.47	10.20	27.10	.55	.22	.23	0
G(H)	1.06	60.00	.47	10.20	27.10	.55	.22	.23	0
2G/1CS	1.04	64.00	.54	9.57	25.88	.44	.21	.21	0

[a/] Net energy for lactation.

ENTERPRISE BUDGETS

FOR DAIRY COWS

G R A S S

Region Code = 3

Enterprise[a]	Dairy Cow		Dairy Cow	
Production Level	10,000# Milk		10,000# Milk	
Forage Composition	Grass Hay Crop Silage		2/3 Forage DM from Grass & 1/3 from Hay Crop Silage	
Enterprise Code Number	66		67	
INCOME:				
Milk @ $9.52/cwt. (1.5% loss)[b]		$ 937.72		$ 937.72
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75
Value of Production		$1,047.55		$1,047.55
1[c] Gross Income (Off-Farm Sales)		$1,032.68		$1,032.68
VARIABLE EXPENSES:				
Fuel, Oil & Grease[d]		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85
Repairs & Maintenance[f]		48.91		52.15
Bedding		10.00		10.00
Breeding		15.00		15.00
Veterinary & Medical		15.00		15.00
Milk Marketing[g]		24.43		24.43
Livestock Marketing[h]		21.00		21.00
Dairy Supplies		12.00		12.00
Utilities		15.00		15.00
Other		12.00		12.00
DiCal	(26)[i]	4.86	(35)	6.66
Lime	(2)	0.04	(10)	0.22
Mono-Phos.		--		--
Salt	(41)	2.15	(42)	2.20
Mg-Ox.		--		--
Interest on Operating Expenses[j]		3.24		3.07
2 Total Selected Variable Expenses		$ 203.48		$ 208.58
Corn Grain	(58.3)[k]	175.40	(40.1)	120.55
Soybean Oil Meal	(5.6)	56.30	(8.4)	83.60
4 Family and Regular Hired Labor, 50 hours @ $3.50		175.00		175.00
Total Variable Expenses (w/o grown feeds)		$ 610.18		$ 587.73
FIXED EXPENSES:				
Manure Handling[l]		30.25		30.25
Feed Storage & Handling		50.46		63.44
Dairy Cow Housing & Milking		135.49		135.49
Depreciation of Cow[m]		45.92		45.92
Interest on & Insurance of Cow[n]		34.96		34.96
Insurance[o]		27.46		29.10
Property Taxes[p]		12.54		13.46
Total Fixed Expenses		$ 337.08		$ 352.62
Total Variable & Fixed Expenses (w/o grown feed)		$ 947.26		$ 940.35
GROWN FEED REQUIREMENTS:				
Hay Equivalent[q]	(4.8)		(5.3)	
Haylage[r]	(10.9)	261.56	(8.1)	193.21
Corn Silage		--	(5.3)	112.27
Value of Grown Feeds		$ 261.56		$ 305.48
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,208.82		$1,245.83

Footnotes are on page 43.

MIXED MAINLY LEGUME

Region Code = 4

Enterprise[a]	Dairy Cow		Dairy Cow		Dairy Cow	
Production Level	10,000# Milk		10,000# Milk		10,000# Milk	
Forage Composition	Mixed Mainly Legume Hay Crop Silage		2/3 Forage DM from MML and 1/3 from Corn Silage		1/3 Forage DM from MML and 2/3 from Corn Silage	
Enterprise Code Number	66		67		68	
INCOME:						
Milk @ $9.52/cwt. (1.5% loss)[b]		$ 937.72		$ 937.72		$ 937.72
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75		29.75
Value of Production		$1,047.55		$1,047.55		$1,047.55
1[c] Gross Income (Off-Farm Sales)		$1,032.68		$1,032.68		$1,032.68
VARIABLE EXPENSES:						
Fuel, Oil & Grease[d]		11.00		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85		8.85
Repairs & Maintenance[f]		49.21		52.41		52.15
Bedding		10.00		10.00		10.00
Breeding		15.00		15.00		15.00
Veterinary & Medical		15.00		15.00		15.00
Milk Marketing[g]		24.43		24.43		24.43
Livestock Marketing[h]		21.00		21.00		21.00
Dairy Supplies		12.00		12.00		12.00
Utilities		15.00		15.00		15.00
Other		12.00		12.00		12.00
DiCal	(29)[i]	5.40	(41)	7.74	(48)	9.00
Lime		--	(106)	2.22	(1)	0.02
Mono-Phos.	(28)	11.60		--		--
Salt	(41)	2.15	(42)	2.20	(41)	2.15
Mg-Ox.		--		--	(0.3)	0.05
Interest on Operating Expenses[j]		2.68		2.60		2.56
2 Total Selected Variable Expenses		$ 215.32		$ 211.45		$ 210.21
Corn Grain	(45.4)[k]	136.45	(34.3)	103.30	(16.2)	48.85
Soybean Oil Meal	(0.9)	8.90	(3.4)	34.20	(8.4)	84.20
4 Family and Regular Hired Labor, 50 hours @ $3.50		175.00		175.00		175.00
Total Variable Expenses (w/o grown feeds)		$ 535.67		$ 523.95		$ 518.26
FIXED EXPENSES:						
Manure Handling[l]		30.25		30.25		30.25
Feed Storage & Handling		51.89		64.59		63.44
Dairy Cow Housing & Milking		135.49		135.49		135.49
Depreciation of Cow[m]		45.92		45.92		45.92
Interest on & Insurance of Cow[n]		34.96		34.96		34.96
Insurance[o]		27.70		29.26		29.10
Property Taxes[p]		12.66		13.56		13.46
Total Fixed Expenses		$ 338.87		$ 354.03		$ 352.62
Total Variable & Fixed Expenses (w/o grown feed)		$ 874.54		$ 877.98		$ 870.88
GROWN FEED REQUIREMENTS:						
Hay Equivalent[q]	(5.1)		(5.1)		(5.0)	
Haylage[r]	(11.6)	343.60	(7.7)	277.25	(3.8)	110.85
Corn Silage		--	(5.1)	107.42	(10.2)	216.08
Value of Grown Feeds		$ 343.60		$ 334.67		$ 326.93
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,218.14		$1,212.65		$1,197.81

Footnotes are on page 43.

G R A S S

Region Code = 3

Enterprise[a]	Dairy Cow		Dairy Cow	
Production Level	13,000# Milk		13,000# Milk	
Forage Composition	Grass Hay Crop Silage		2/3 Forage DM from Grass & 1/3 from Corn Silage	
Enterprise Code Number	70		71	
INCOME:				
Milk @ $9.52/cwt. (1.5% loss)[b]		$1,219.04		$1,219.04
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75
Value of Production		$1,328.87		$1,328.87
1[c] Gross Income (Off-Farm Sales)		$1,314.00		$1,314.00
VARIABLE EXPENSES:				
Fuel, Oil & Grease[d]		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85
Repairs & Maintenance[f]		48.91		52.15
Bedding		10.00		10.00
Breeding		17.50		17.50
Veterinary & Medical		22.00		22.00
Milk Marketing[g]		31.76		31.76
Livestock Marketing[h]		21.00		21.00
Dairy Supplies		15.00		15.00
Utilities		17.50		17.50
Other		15.00		15.00
DiCal	(37)[i]	7.02	(44)	8.28
Lime	(11)	0.24	(23)	0.48
Mono-Phos.		--		--
Salt	(42)	2.20	(44)	2.30
Mg-Ox.		--		--
Interest on Operating Expenses[j]		4.17		4.01
2 Total Selected Variable Expenses		$ 232.15		$ 236.83
Corn Grain	(76.7)[k]	230.65	(59.6)	179.10
Soybean Oil Meal	(9.7)	97.30	(12.3)	123.00
4 Family and Regular Hired Labor, 57 hours @ $3.50		199.50		199.50
Total Variable Expenses (w/o grown feeds)		$ 759.60		$ 738.43
FIXED EXPENSES:				
Manure Handling[l]		30.25		30.25
Feed Storage & Handling		50.46		63.44
Dairy Cow Housing & Milking		135.49		135.49
Depreciation of Cow[m]		73.92		73.92
Interest on & Insurance of Cow[n]		39.71		39.71
Insurance[o]		27.46		29.10
Property Taxes[p]		12.54		13.46
Total Fixed Expenses		$ 369.83		$ 385.37
Total Variable & Fixed Expenses (w/o grown feed)		$1,129.43		$1,123.80
GROWN FEED REQUIREMENTS:				
Hay Equivalent[q]	(4.5)		(5.0)	
Haylage[r]	(10.3)	248.10	(7.6)	183.07
Corn Silage			(5.0)	106.38
Value of Grown Feeds		$ 248.10		$ 289.45
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,377.53		$1,413.25

Footnotes are on page 43.

MIXED MAINLY LEGUME

Region Code = 4

Enterprise[a]	Dairy Cow		Dairy Cow		Dairy Cow	
Production Level	13,000# Milk		13,000# Milk		13,000# Milk	
Forage Composition	Mixed Mainly Legume Hay Crop Silage		2/3 Forage DM from MML & 1/3 from Corn Silage		1/3 Forage DM from MML & 2/3 from Corn Silage	
Enterprise Code Number	70		71		72	
INCOME:						
Milk @ $9.52/cwt. (1.5% loss)[b]		$1,219.04		$1,210.04		$1,219.04
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75		29.75
Value of Production		$1,328.87		$1,328.87		$1,328.87
1[c] Gross Income (Off-Farm Sales)		$1,314.00		$1,314.00		$1,314.00
VARIABLE EXPENSES:						
Fuel, Oil & Grease[d]		11.00		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85		8.85
Repairs & Maintenance[f]		49.21		52.41		52.15
Bedding		10.00		10.00		10.00
Breeding		17.50		17.50		17.50
Veterinary & Medical		22.00		22.00		22.00
Milk Marketing[g]		31.76		31.76		31.76
Livestock Marketing[h]		21.00		21.00		21.00
Dairy Supplies		15.00		15.00		15.00
Utilities		17.50		17.50		17.50
Other		15.00		15.00		15.00
DiCal	(43)[i]	7.92	(52)	9.90	(58)	10.98
Lime		--	(116)	2.44	(6)	0.12
Mono-Phos.	(8)	3.20		--		--
Salt	(42)	2.20	(43)	2.25	(42)	2.20
Mg-Ox.		--		--	(0.3)	0.05
Interest on Operating Expenses[j]		3.53		3.57		3.48
2 Total Selected Variable Expenses		$ 235.67		$ 240.18		$ 238.59
Corn Grain	(66.9)[k]	201.30	(54.9)	165.10	(35.5)	106.90
Soybean Oil Meal	(3.7)	36.70	(7.4)	74.20	(12.3)	122.60
4 Family and Regular Hired Labor, 57 hours @ $3.50		199.50		199.50		199.50
Total Variable Expenses (w/o grown feeds)		$ 673.17		$ 678.98		$ 667.59
FIXED EXPENSES:						
Manure Handling[l]		30.25		30.25		30.25
Feed Storage & Handling		51.89		64.59		63.44
Dairy Cow Housing & Milking		135.49		135.49		135.49
Depreciation of Cow[m]		73.92		73.92		73.92
Interest on & Insurance of Cow[n]		39.71		39.71		39.71
Insurance[o]		27.70		29.26		29.10
Property Taxes[p]		12.66		13.56		13.46
Total Fixed Expenses		$ 371.62		$ 386.78		$ 385.37
Total Variable & Fixed Expenses (w/o grown feed)		$1,044.79		$1,065.76		$1,052.96
GROWN FEED REQUIREMENTS:						
Hay Equivalent[q]	(4.9)		(4.8)		(4.8)	
Haylage[r]	(11.0)	325.83	(7.3)	214.81	(3.6)	106.44
Corn Silage		--	(4.8)	101.54	(9.8)	207.49
Value of Grown Feeds		$ 325.83		$ 316.35		$ 313.93
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,370.62		$1,382.11		$1,366.89

Footnotes are on page 43.

G R A S S

Region Code = 3

Enterprise[a]	Dairy Cow		Dairy Cow	
Production Level	16,000# Milk		16,000# Milk	
Forage Composition	Grass Hay Crop Silage		2/3 Forage DM from Grass & 1/3 from Corn Silage	
Enterprise Code Number	74		75	
INCOME:				
Milk @ $9.52/cwt. (1.5% loss)[b]		$1,500.35		$1,500.35
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75
Value of Production		$1,610.18		$1,610.18
1[c] Gross Income (Off-Farm Sales)		$1,595.31		$1,595.31
VARIABLE EXPENSES:				
Fuel, Oil & Grease[d]		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85
Repairs & Maintenance[f]		48.91		52.15
Bedding		10.00		10.00
Breeding		20.00		20.00
Veterinary & Medical		30.00		30.00
Milk Marketing[g]		39.08		39.08
Livestock Marketing[h]		21.00		21.00
Dairy Supplies		18.00		18.00
Utilities		20.00		20.00
Other		20.00		20.00
DiCal	(48)[i]	9.00	(55)	10.44
Lime	(23)	0.48	(37)	0.78
Mono-Phos.		--		--
Salt	(44)	2.30	(45)	2.35
Mg-Ox.		--		--
Interest on Operating Expenses[j]		5.15		5.00
2 Total Selected Variable Expenses		$ 263.77		$ 268.65
Corn Grain	(95.9)[k]	288.35	(79.3)	238.45
Soybean Oil Meal	(14.0)	140.20	(16.4)	164.20
4 Family and Regular Hired Labor, 66 hours @ $3.50		231.00		231.00
Total Variable Expenses (w/o grown feeds)		$ 923.32		$ 902.30
FIXED EXPENSES:				
Manure Handling[l]		30.25		30.25
Feed Storage & Handling		50.46		63.44
Dairy Cow Housing & Milking		135.49		135.49
Depreciation of Cow[m]		101.92		101.92
Interest on & Insurance of Cow[n]		44.46		44.46
Insurance[o]		27.46		29.10
Property Taxes[p]		12.54		13.46
Total Fixed Expenses		$ 402.58		$ 418.12
Total Variable & Fixed Expenses (w/o grown feed)		$1,325.90		$1,320.42
GROWN FEED REQUIREMENTS:				
Hay Equivalent[q]	(4.3)	--	(4.7)	--
Haylage[r]	(9.7)	233.94	(7.2)	172.62
Corn Silage		--	(4.7)	100.38
Value of Grown Feeds		$ 233.94		$ 273.00
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,559.84		$1,593.42

Footnotes are on page 43.

M I X E D M A I N L Y L E G U M E

Region Code = 4

Enterprise[a]	Dairy Cow		Dairy Cow		Dairy Cow	
Production Level	16,000# Milk		16,000# Milk		16,000# Milk	
Forage Composition	Mixed Mainly Legume Hay Crop Silage		2/3 Forage DM from MML & 1/3 from Corn Silage		1/3 Forage DM from MML & 2/3 from Corn Silage	
Enterprise Code Number	74		75		76	
INCOME:						
Milk @ $9.52/cwt. (1.5% loss)[b]	$1,500.35		$1,500.35		$1,500.35	
Culls: 28% culling rate; 13 cwt. @ $22	80.08		80.08		80.08	
Calves: 0.85/cow-yr. @ $35	29.75		29.75		29.75	
Value of Production	$1,610.18		$1,610.18		$1,610.18	
1[c] Gross Income (Off-Farm Sales)	$1,595.31		$1,595.31		$1,595.31	
VARIABLE EXPENSES:						
Fuel, Oil & Grease[d]		11.00		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85		8.85
Repairs & Maintenance[f]		49.21		52.41		52.15
Bedding		10.00		10.00		10.00
Breeding		20.00		20.00		20.00
Veterinary & Medical		30.00		30.00		30.00
Milk Marketing[g]		39.08		39.08		39.08
Livestock Marketing[h]		21.00		21.00		21.00
Dairy Supplies		18.00		18.00		18.00
Utilities		20.00		20.00		20.00
Other		20.00		20.00		20.00
DiCal	(56)[i]	10.62	(62)	11.70	(67)	12.60
Lime		--	(126)	2.64	(17)	0.36
Mono-Phos.	(7)	2.80		--		--
Salt	(43)	2.25	(46)	2.35	(44)	2.30
Mg-Ox.		--		--	(0.3)	0.05
Interest on Operating Expenses[j]		4.55		4.59		4.49
2 Total Selected Variable Expenses		$ 267.36		$ 271.62		$ 269.88
Corn Grain	(88.6)[k]	266.55	(75.7)	227.75	(56.7)	170.40
Soybean Oil Meal	(7.7)	76.70	(11.7)	117.30	(16.3)	162.90
4 Family and Regular Hired Labor, 66 hours @ $3.50		231.00		231.00		231.00
Total Variable Expenses (w/o grown feeds)		$ 841.61		$ 847.67		$ 834.18
FIXED EXPENSES:						
Manure Handling[l]		30.25		30.25		30.25
Feed Storage & Handling		51.89		64.59		63.44
Dairy Cow Housing & Milking		135.49		135.49		135.49
Depreciation of Cow[m]		101.92		101.92		101.92
Interest on & Insurance of Cow[n]		44.46		44.46		44.46
Insurance[o]		27.70		29.26		29.10
Property Taxes[p]		12.66		13.56		13.46
Total Fixed Expenses		$ 404.37		$ 419.53		$ 418.12
Total Variable & Fixed Expenses (w/o grown feed)		$1,245.98		$1,267.20		$1,252.30
GROWN FEED REQUIREMENTS:						
Hay Equivalent[q]	(4.6)	--	(4.5)	--	(4.6)	--
Haylage[r]	(10.4)	307.66	(6.8)	202.00	(3.4)	100.83
Corn Silage		--	(4.5)	95.48	(9.2)	196.55
Value of Grown Feeds		$ 307.66		$ 297.48		$ 297.38
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,553.64		$1,564.68		$1,549.68

Footnotes are on page 43.

M I X E D M A I N L Y L E G U M E

Region Code = 4

Enterprise[a]	Dairy Cow		Dairy Cow		Dairy Cow	
Production Level	18,000# Milk		18,000# Milk		18,000# Milk	
Forage Composition	Mixed Mainly Legume Hay Crop Silage		2/3 Forage DM from MML & 1/3 from Corn Silage		1/3 Forage DM from MML & 2/3 from Corn Silage	
Enterprise Code Number	78		79		80	
INCOME:						
Milk @ $9.52/cwt. (1.5% loss)[b]		$1,687.90		$1,687.90		$1,687.90
Culls: 28% culling rate; 13 cwt. @ $22		80.08		80.08		80.08
Calves: 0.85/cow-yr. @ $35		29.75		29.75		29.75
Value of Production		$1,797.73		$1,797.73		$1,797.73
1[c] Gross Income (Off-Farm Sales)		$1,782.86		$1,782.86		$1,782.86
VARIABLE EXPENSES:						
Fuel, Oil & Grease[d]		11.00		11.00		11.00
Repairs & Maintenance[e]		8.85		8.85		8.85
Repairs & Maintenance[f]		49.21		52.41		52.15
Bedding		10.00		10.00		10.00
Breeding		21.00		21.00		21.00
Veterinary & Medical		35.00		35.00		35.00
Milk Marketing[g]		43.97		43.97		43.97
Livestock Marketing[h]		21.00		21.00		21.00
Dairy Supplies		20.00		20.00		20.00
Utilities		22.00		22.00		22.00
Other		25.00		25.00		25.00
DiCal	(63)[i]	11.88	(69)	12.96	(74)	14.04
Lime		--	(133)	2.80	(24)	0.50
Mono-Phos.	(7)	2.80		--		--
Salt	(46)	2.40	(46)	2.40	(45)	2.35
Mg-Ox.		--		--	(0.3)	0.05
Interest on Operating Expenses[j]		5.19		5.29		5.22
2 Total Selected Variable Expenses		$ 289.30		$ 293.68		$ 292.13
Corn Grain	(100.5)[k]	302.35	(89.8)	270.15	(73.1)	219.80
Soybean Oil Meal	(10.6)	105.80	(14.7)	146.60	(18.9)	189.00
4 Family and Regular Hired Labor, 71 hours @ $3.50		248.50		248.50		248.50
Total Variable Expenses (w/o grown feeds)		$ 945.95		$ 958.93		$ 949.43
FIXED EXPENSES:						
Manure Handling[l]		30.25		30.25		30.25
Feed Storage & Handling		51.89		64.59		63.44
Dairy Cow Housing & Milking		135.49		135.49		135.49
Depreciation of Cow[m]		115.92		115.92		115.92
Interest on & Insurance of Cow[n]		46.84		46.84		46.84
Insurance[o]		27.70		29.26		29.10
Property Taxes[p]		12.66		13.56		13.46
Total Fixed Expenses		$ 420.75		$ 435.91		$ 434.50
Total Variable & Fixed Expenses (w/o grown feed)		$1,366.70		$1,394.84		$1,383.93
GROWN FEED REQUIREMENTS:						
Hay Equivalent[q]	(4.4)		(4.3)		(4.3)	
Haylage[r]	(10.0)	295.29	(6.5)	193.12	(3.2)	95.87
Corn Silage		--	(4.3)	97.74	(8.8)	186.87
Value of Grown Feeds		$ 295.29		$ 290.86		$ 282.74
TOTAL VARIABLE AND FIXED EXPENSES[s]		$1,661.99		$1,685.70		$1,666.67

Footnotes are on page 43.

Footnotes for Dairy Cow Enterprise Budgets

a/ Rations and management practices explained in the text and equipment complements listed in Table 2 were used in budget construction.

b/ Derived from the average New York-New Jersey blend price for 1977 adjusted for mileage to New York City and fat content.

c/ Column numbers are codes for NEWPLAN 65.

d/ For power and machinery used in manure handling, feed storage and handling, and miscellaneous operations related to the dairy enterprise; based on estimates of equipment use.

e/ For manure handling equipment, as listed in Table 2; based on estimates of equipment use; see Tables 2, 3, and 4 for derivation of these and following repair and maintenance costs.

f/ For equipment and facilities used in feed storage and handling and dairy cow housing and milking.

g/ Based on charges made by a common handler in Northern New York: 1.5¢/cwt. for Co-op dues, capital deduction 3.3¢/cwt., hauling charges 15¢/cwt., dairy promotion 5¢/cwt.

h/ Covers marketing of bull calves, surplus heifers and culls; based on data from New York State Cost Accounts.

i/ The numbers in parentheses are pounds of minerals bought for each cow.

j/ Interest on cash expenses (excluding labor) for one month at 9%.

k/ Amounts of feeds consumed per cow. Corn grain in bushels, soybean oil meal in cwt., forages in tons. Storage and feeding losses are accounted for in the budgets. Nutritional contents are in Table 6.

l/ Fixed expenses are derived from Tables 2, 3, and 4. Manure handling, feed storage and handling, and dairy cow housing and milking items are for depreciation and interest.

m/ Based on a 28% cull rate, $22/cwt. cull value, 1300 lbs, and $450, $550, $650, and $700 initial values, depending on production level.

n/ Based on the average of the initial and cull values in footnote m, a 9% interest rate and insurance at 0.5% of average value.

o/ For facilities and equipment for manure handling, feed storage and handling, and dairy cow housing and milking.

p/ Charged at a rate of $1.75 per $1,000 of value, with value set at 1/2 of new cost for equipment and facilities and at current value for land.

q/ Computed by dry matter comparisons. With 1 hay equivalent equal to 1 ton of dry hay, at 90% dry matter, conversion factors are: for dry hay, 1.00; for hay crop silage, 0.44; and for corn silage, 0.33.

r/ Forage requirements and costs are shown in Table 7.

s/ Based on one set of assumptions, these figures do not represent actual current average costs of production in Northern New York, though they are relevant to this area.

The Dairy Cow Budgets

Dairy cow enterprise budgets are presented in a format similar to that used for the crop budgets. Separate budgets are presented for mixed mainly legume and grass hay as the forage hay crop base. Income is identical for the two hay crop bases at given production levels.

Income

Income comes from the production and sale of livestock--culls and calves--and from the sale of milk. Twenty-eight percent of the herd is culled annually and 85 percent of the cows produce calves which survive until they are culled or sold. Equal numbers of male and female calves are expected, with the females being kept. Keeping the females reduces the gross income received from off-farm sales by the expected value of the heifer calf. Milk sales are 1.5 percent less than the amount stated at the head of the budget. This covers milk left in lines and flushed out of the milking system in cleaning. Cull and calf income are constant among all the budgets. The differences in gross incomes is entirely from differences in milk production.

Investment in Dairy Facilities

The buildings assumed for dairy cow housing, feeding, milking and manure storage are indicated in Table 2 and Table 4. Feed storage systems hold sufficient forage for all production levels, although there would be virtually no excess capacity at 10,000 pounds production. Annual fixed expenses are calculated using the factors in Table 3 and the budget footnotes. Depreciation and interest costs are divided between dairy cow housing and milking, feed storage and handling, and manure handling.

Feed Requirements and Costs

Least cost balanced ration for 10, 13, 16, and 18,000 pounds annual production are presented in Tables 7 and 8. The quantities listed are annual amounts consumed by the cows without storage and feeding losses. Several trends are noticeable in the consumption of corn grain, soybean oil meal and roughages. As production levels increase from 10 to 18,000 pounds roughage consumption declines in all rations. Because of their bulk and low concentration of nutrients, roughages alone cannot meet the animal's requirements for more nutrients. They are the cheapest sources of protein and energy, however, and are utilized as much as possible.

Comparing forage compositions using the same hay crop shows two opposite trends in roughage consumption. When corn silage is substituted for some of the grass hay, the total number of hay equivalents consumed increases (Table 7). With the higher energy and lower protein contents of corn silage, corn grain consumption drops and soybean oil meal consumption increases. For rations using mixed mainly legume hay, the opposite trend occurs with respect to hay equivalents consumed, which decline slightly as corn silage is substituted for the hay crop silage (Table 8). Nevertheless, the same general effects appear in corn grain and soybean oil meal.

Table 7. Dairy Cow Feed Requirements for Three Alternative Forage Compositions with Grass Hay Crop Silage.[a/]

	Pounds of Milk Per Cow		
	10,000	13,000	16,000
All hay crop - G(H)			
Hay crop silage (T. hay equivalent)	4.8[b/]	4.6	4.3
Corn silage (T.)[c/]	0	0	0
Dry shelled corn (bu.)	58	77	96
Soybean oil meal (cwt.)	5	9	13
2/3 hay crop & 1/3 corn silage - 2G/1CS			
Hay crop silage (T. hay equivalent)	3.6	3.4	3.2
Corn silage (T.)[c/]	5.3	5.0	4.7
Dry shelled corn (bu.)	40	60	79
Soybean oil meal (cwt.)	8	11	15
1/3 hay crop & 2/3 corn silage - 1G/2CS			
Hay crop silage (T. hay equivalent)	1.6	1.6	1.5
Corn silage (T.)[c/]	9.8	9.4	9.0
Dry shelled corn (bu.)	15	34	55
Soybean oil meal (cwt.)	11	14	18

[a/] Rations in Region 3 of NEWPLAN data file.

[b/] Quantities are amounts consumed. No storage or feeding losses are included.

[c/] 30 percent dry matter.

Table 8. Dairy Cow Feed Requirements for Three Alternative Forage Compositions with Mixed Mainly Legume Hay Crop Silage.[a/]

	Pounds of Milk Per Cow			
	10,000	13,000	16,000	18,000
All hay crop - MML(H)				
Hay crop silage (T. hay equivalent)	5.2[b/]	4.9	4.6	4.5
Corn silage (T.)[c/]	0	0	0	0
Dry shelled corn (bu.)	45	66	89	101
Soybean oil meal (cwt.)	1	3	7	10
2/3 hay crop & 1/3 corn silage - 2MML/1CS				
Hay crop silage (T. hay equivalent)	3.4	3.2	3.0	2.9
Corn silage (T.)[c/]	5.1	4.8	4.5	4.3
Corn grain (bu.)	34	55	76	90
Soybean oil meal (cwt.)	3	7	11	14
1/3 hay crop & 2/3 corn silage - 1MML/2CS				
Hay crop silage (T. hay equivalent)	1.7	1.6	1.5	1.4
Corn silage (T.)[c/]	10.2	9.8	9.2	8.8
Corn grain (bu.)	16	36	57	73
Soybean oil meal (cwt.)	8	11	15	18

[a/] Rations in Region 4 of NEWPLAN data file.

[b/] Quantities are amounts of feed consumed. No storage or feeding losses are included.

[c/] 30 percent dry matter.

Since the cost of providing feed to a cow includes feed lost in storage and feeding as well as consumption, storage and feeding losses (Table 9) were accounted for before the costs of the feeds were computed in the enterprise budgets. Selling prices were used for forages (Table 5) to portray the opportunity cost of feeding. Total feed costs are found in the budgets. They increase with the rise in milk production. Feed costs are quite similar at each production level, with differences less than $50 which diminish as production increases.

Variable and Total Expenses

Repairs and maintenance are accounted separately for the manure handling system and for the buildings and facilities. These costs are usually higher than those found in most farm records since all repairs are included in the item, whereas a farm manager can depreciate major repair expense which then becomes a part of fixed expenses.

Milk marketing costs were assessed on the basis of the amount of milk produced and include co-op dues, a capital deduction, hauling and dairy promotion. The livestock marketing costs apply to sales of bull calves, surplus heifers, and culls, and include hauling and commissions.

The interest on operating capital is charged at 9 percent per year for one month on the total of all variable expenses except labor. This represents the time that the farmer's capital is tied up in feeds and allied inputs.

Total fixed and variable expenses increase with production level, though not as fast as gross income. Expenses often exceed returns. Comparing total costs among the different rations reveals their similarity, within a range of $50 at a given production level.

Substitutions and Revisions

The usefulness of these budgets is greatly increased by changing the figures included in the budgets to more accurately portray the farm of interest. These changes can represent simple differences in prices paid and received or more basic differences in the organization and operation of the farm.

Commonly Northern New York farmers do not mix their own complete feeds; they buy pre-mixed concentrates and use these with their own forages. The variety of different concentrates used made it simpler to prepare the budgets using corn grain, soybean oil meal and individual minerals. Substitution of any balanced ration currently being fed tailors the budgets to the farm in question. Another change in the ration could be the substitution of dry hay for the hay crop silage. In this case, dry hay can replace the hay crop silage approximately on a dry matter basis (Table 6).

Different herd size is unlikely to substantially change the variable costs per cow. Fixed costs might show some decline with larger herds. However, the assumption of close to optimal sizes of equipment and facilities means that as long as the herd size was matched to the barn and other investments, costs would be relatively stable with regard to size.

Farms growing their own grain, as with the optional high moisture ear corn enterprise, would have additional costs for storing the grain. Grain purchase costs would be reduced.

Table 9. Storage and Feeding Losses for Dry Hay, Hay Crop Silage, Corn Silage and Corn Grain for Alternative Storage Systems.

Feed and Storage Type	Storage Losses[a]	Feeding Losses[a]
	Percent of Harvested Yield	
Dry Hay		
Barn	5.3	10.7
Piled	5.3	10.7
Hay Crop Silage		
Sealed storage	6.3	7.4
Cement stave[b]	12.6	7.4
Bunker or trench	18.9	7.4
Piled and covered	23.2	7.4
Corn Silage		
Sealed storage	5.3	6.3
Cement stave[b]	8.4	6.3
Bunker or trench	12.6	6.3
Piled and covered	15.8	6.3
Corn Grain		
Dry	2.1	5.3
High moisture, sealed	5.3	5.3
High moisture, not sealed storage[b]	8.4	5.3
High moisture, bunker or trench	15.8	5.3

[a] All losses are based on yield in storage.

[b] These storage losses are used in the basic enterprise budgets.

Source: Nott, S. B., Investment Planning for New Dairy Systems, Users' Manual, Telplan Program 02, Department of Agricultural Economics, Michigan State University.

ENTERPRISE BUDGETS

FOR DAIRY HEIFERS

G R A S S

Region Code = 3

Enterprise	Dairy Heifer		Dairy Heifer	
Production Level	Birth to Freshen		Birth to Freshen	
Forage Composition	Grass Hay Crop Silage		2/3 Forage DM from Grass & 1/3 from Corn Silage	
Enterprise Code Number	85		86	
INCOME: Value of Production		$450-650[a]		$450-650
1 Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00
VARIABLE EXPENSES:				
Fuel, Oil, & Grease[b]		3.57		3.57
Repairs & Maintenance[c]		10.92		10.92
Repairs & Maintenance[d]		37.63		40.33
Bedding[e]		22.00		22.00
Breeding[f]		17.50		17.50
Veterinary & Medical		7.00		7.00
Supplies & Utilities		12.20		12.20
Other		9.45		9.45
Milk Replacer: @ $35/cwt.	(27)[g]	9.45	(27)	9.45
DiCal	(18)	3.24	(27)	4.86
Salt	(42)	2.10	(43)	2.15
Interest on Operating Expenses		36.15		33.69
2 Total Selected Variable Expenses		$ 171.21		$ 173.12
Corn Grain	(70.8)	197.05	(59.9)	166.90
Soybean Oil Meal	(1.2)	12.20	(1.5)	14.50
4 Family and Regular Hired Labor, 25 hours @ $3.50		87.50		87.50
Total Variable Expenses (w/o grown feeds)		$ 467.96		$ 442.02
FIXED EXPENSES:				
Power & Machinery[h]		29.63		29.63
Buildings & Feed Storage		140.50		151.29
Livestock Equipment		7.92		7.92
Interest on & Insurance of Calf[i]		9.78		9.78
Insurance[j]		25.13		26.42
Property Taxes[k]		11.13		11.96
Value of Calf		35.00		35.00
Total Fixed Expenses		$ 259.09		$ 272.00
Total Variable & Fixed Expenses (w/o grown feeds)		$ 727.05		$ 714.02
GROWN FEED REQUIREMENTS:				
Hay Equivalent[l]	(4.2)		(4.5)	
Hay	(0.2)	10.70	(0.2)	10.70
Hay Crop Silage	(8.7)	167.74	(6.5)	125.04
Pasture	(1.6)	48.98	(1.8)	53.07
Corn Silage		--	(4.0)	72.66
Value of Grown Feeds		$ 227.42		$ 261.47
TOTAL VARIABLE AND FIXED EXPENSES		$ 954.47		$ 975.49

Footnotes are on page 54.

M I X E D M A I N L Y L E G U M E

Region Code = 4

Enterprise	Dairy Heifer		Dairy Heifer		Dairy Heifer	
Production Level	Birth to Freshen		Birth to Freshen		Birth to Freshen	
Forage Composition	Mixed Mainly Legume Hay Crop Silage		2/3 Forage DM from MML & 1/3 from Corn Silage		1/3 Forage DM from MML & 2/3 from Corn Silage	
Enterprise Code Number	85		86		87	
INCOME: Value of Production		$450-700[a]		$450-700		$450-700
1 Gross Income (Off-Farm Sales)		$ 0.00		$ 0.00		$ 0.00
VARIABLE EXPENSES:						
Fuel, Oil & Grease[b]		3.57		3.57		3.57
Repairs & Maintenance[c]		10.92		10.92		10.92
Repairs & Maintenance[d]		37.88		40.54		40.33
Bedding[e]		22.00		22.00		22.00
Breeding[f]		17.50		17.50		17.50
Veterinary & Medical		7.00		7.00		7.00
Supplies & Utilities		12.20		12.20		12.20
Other		9.45		9.45		9.45
Milk Replacer: @ $35/cwt.	(27)[g]	9.45	(27)	9.45	(27)	9.45
DiCal	(17)	3.06	(26)	4.68	(38)	6.84
Lime		--	(62)	1.24		--
Salt	(42)	2.10	(43)	2.15	(42)	2.10
Interest on Operating Expenses		29.93		28.84		14.84
2 Total Selected Variable Expenses		$ 165.06		$ 169.54		$ 156.20
Corn Grain	(51.1)	142.25	(45.4)	126.30	(34.7)	96.60
Soybean Oil Meal	(0.8)	7.70	(0.8)	7.70	(1.1)	11.20
4 Family and Regular Hired Labor, 25 hours @ $3.50		87.50		87.50		87.50
Total Variable Expenses (w/o grown feeds)		$ 402.51		$ 391.04		$ 351.50
FIXED EXPENSES:						
Power & Machinery[h]		29.63		29.63		29.63
Buildings & Feed Storage		141.71		152.29		151.29
Livestock Equipment		7.92		7.92		7.92
Interest on & Insurance of Calf[i]		9.78		9.78		9.78
Insurance[j]		25.29		26.63		26.42
Property Taxes[k]		11.25		12.04		11.96
Value of Calf		35.00		35.00		35.00
Total Fixed Expenses		$ 260.58		$ 273.29		$ 272.00
Total Variable & Fixed Expenses (w/o grown feeds)		$ 663.09		$ 664.33		$ 623.50
GROWN FEED REQUIREMENTS:						
Hay Equivalent[l]	(4.5)		(4.4)		(4.3)	
Hay	(0.2)	13.08	(0.2)	13.08	(0.2)	13.08
Hay Crop Silage	(9.6)	226.26	(6.4)	150.32	(3.1)	74.33
Pasture	(1.8)	53.47	(1.7)	51.96	(1.7)	51.04
Corn Silage		--	(3.9)	71.06	(8.0)	144.88
Value of Grown Feeds		$ 292.81		$ 286.42		$ 283.33
TOTAL VARIABLE AND FIXED EXPENSES		$ 955.90		$ 950.75		$ 906.83

Footnotes are on page 54.

Footnotes for Heifer Enterprise Budgets

a/ The value of the heifer depends on expected milk production.

b/ Based on expected equipment use in feeding and manure spreading.

c/ For use of power and machinery in the heifer operation; see Tables 2 and 4.

d/ For use of buildings, feed storage and equipment by the heifer operation.

e/ This and other entries not referenced are based on Knoblauch, Milligan and Woodell.

f/ Assumed to be the same as for a 13,000 lbs./year cow.

g/ Numbers in parentheses are amounts of feed ingredients. Milk replacer and minerals are in pounds; corn grain in bushels; soybean oil meal in hundredweight; hay, hay crop and corn silage, and pasture in tons (with a yield of 1 ton/acre of hay equivalent, acres of pasture will equal tons of pasture).

h/ Depreciation and interest costs for power and machinery, buildings and feed storage, and livestock equipment are derived from Tables 2-5, as are the insurance and tax costs.

i/ Interest on the calf is charged at 9 percent of its cost, insurance at 0.5 percent of average value, assuming a heifer value of $650.

j/ Costs of insurance of power, machinery, buildings, feed storage, and livestock equipment.

k/ Taxes on real property are charged at $1.75 per $1,000 of average value (equals 1/2 initial cost), except for land, for which the current value is used.

l/ See footnote q of the dairy budgets for an explanation of the source and use of the hay equivalent terms.

The Dairy Heifer Enterprise Budgets

The dairy heifer enterprise budgets cover the period from birth to freshening, assumed to be 28 months. Their format is basically the same as for the dairy enterprise. Some salient differences and important assumptions will be mentioned, otherwise, the sources used, definitions, and comparisons among the rations are the same. Budgets were constructed for the same five rations. Those using grass hay crops refer to Region 3 in the NEWPLAN data file and those using mixed mainly legume to Region 4.

Heifer rations were formulated in the same manner as the dairy cow rations (Table 10). Nutrient requirements were determined for nine age classes on a growth curve producing a 1,050 lb. heifer which freshened at 28 months (Slack, et al.; NRC). Two alterations were made. From month 26 to 28, the heifer's ration was for a dry cow in the last two months of pregnancy, with a 20 percent increase in nutrient allowance to support growth. The ration for the first six weeks was taken from Slack et al. The total feed requirements for the 28 months include eight spent on pasture.

The value of production is variable because it depends on the expected milk producing ability of the heifer. Costs of raising a heifer are also highly variable.

Costs related to manure handling and feed storage and handling are shared by the heifer and dairy cow enterprises. The fuel and repair costs listed include the heifer enterprise's share of the total costs of these items. This is also true for the fixed expenses for equipment and buildings (Table 4). Separate housing is assumed for the heifers and is also included in the building expense.

The heifer budgets are used in annual budgeting on the basis of the number of replacements produced, rather than the number of animals in the heifer herd. That is, to use the 28-month budget for twelve month periods, the number of replacements and/or bred heifers sold should be used as the number of production units, rather than the number of animals in the heifer herd. If average annual costs per heifer are desired, the budgets should be multiplied by 12/28.

As with the dairy budgets, it may be desirable to replace the corn grain, soybean oil meal and minerals with a nutritionally equivalent purchased concentrate mix.

Table 10. Dairy Heifer Requirements for Three Alternative Forage Compositions with Grass and Mixed Mainly Legume Hay Crop Silages.

	Grass[a/]	Mixed Mainly Legume[b/]
All hay crop silage		
Hay crops (T. hay equivalent)	3.3[c/]	3.6
Corn silage (T.)[d/]	0	0
Dry shelled corn (bu.)	66	47
Soybean oil meal (cwt.)	1	1
2/3 hay crop & 1/3 corn silage		
Hay crops (T. hay equivalent)	2.5	2.5
Corn silage (T.)[d/]	3.4	3.3
Dry shelled corn (bu.)	55	42
Soybean oil meal (cwt.)	1	1
1/3 hay crop & 2/3 corn silage		
Hay crops (T. hay equivalent)	1.7	1.3
Corn silage (T.)[d/]	9.8	6.8
Dry shelled corn (bu.)	32	32
Soybean oil meal (cwt.)	3	1

[a/] Rations stored in Region 3 of NEWPLAN data file.

[b/] Rations stored in Region 4 of NEWPLAN data file.

[c/] Quantities are amounts consumed. No storage or feeding losses are included.

[d/] 30 percent dry matter.

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APPENDIX A

LABOR DISTRIBUTION TABLES

LABOR DISTRIBUTION FOR REGION 3 (IN % OF ANNUAL NEEDS)

Enterprise	Row No.	Jan. 1st	Jan. 2nd	Feb. 1st	Feb. 2nd	Mar. 1st	Mar. 2nd	Apr. 1st	Apr. 2nd	May 1st	May 2nd	June 1st	June 2nd	July 1st	July 2nd	Aug. 1st	Aug. 2nd	Sept. 1st	Sept. 2nd	Oct. 1st	Oct. 2nd	Nov. 1st	Nov. 2nd	Dec. 1st	Dec. 2nd
Column No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Empty 1	01																								
Empty 2	02																								
Empty 3	03																								
(Oats)	04							09	21	21				07	15	19	08								
(Wheat)	05																								
(Barley)	06																								
Dry hay 1	07									06		12	16	20	17	13	08	04	04						
Dry hay 2	08									06		12	16	20	17	13	08	04	04						
Dry hay 3	09									06		12	16	20	17	13	08	04	04						
Haylage 1	10									06		12	16	20	17	13	08	04	04						
Haylage 2	11									06		12	16	20	17	13	08	04	04						
Haylage 3	12									06		12	16	20	17	13	08	04	04						
Corn silage 1	14						01	05	08	10	13	07	03				05	07	21	20						
Corn silage 2	15						01	05	08	10	13	07	03				05	07	21	20						
Corn silage 3	16						01	05	08	10	13	07	03				05	07	21	20						
Corn grain 1	17						01	07	12	14	18	10	04						04	06	10	10	04		
Corn grain 2	18						01	07	12	14	18	10	04						04	06	10	10	04		
Corn grain 3	19						01	07	12	14	18	10	04						04	06	10	10	04		
(Soybeans)	20																								
(Dry beans)	21																								
Dairy cow	23	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Heifer	27	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2

LABOR DISTRIBUTION FOR REGION 4 (IN % OF ANNUAL NEEDS)

Enterprise	Row No.	Jan. 1st	Jan. 2nd	Feb. 1st	Feb. 2nd	Mar. 1st	Mar. 2nd	Apr. 1st	Apr. 2nd	May 1st	May 2nd	June 1st	June 2nd	July 1st	July 2nd	Aug. 1st	Aug. 2nd	Sept. 1st	Sept. 2nd	Oct. 1st	Oct. 2nd	Nov. 1st	Nov. 2nd	Dec. 1st	Dec. 2nd
Column No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Empty 1	01																								
Empty 2	02																								
Empty 3	03																								
(Oats)	04							09	21	21				07	15	19	08								
(Wheat)	05																								
(Barley)	06																								
Dry hay 1	07									06		12	16	20	16	06	08	12	04						
Dry hay 2	08									06		12	16	20	16	06	08	12	04						
Dry hay 3	09									06		12	16	20	16	06	08	12	04						
Haylage 1	10									06		12	16	20	16	06	08	12	04						
Haylage 2	11									06		12	16	20	16	06	08	12	04						
Haylage 3	12									06		12	16	20	16	06	08	12	04						
Corn silage 1	14						01	05	08	10	13	07	03				05	07	21	20						
Corn silage 2	15						01	05	08	10	13	07	03				05	07	21	20						
Corn silage 3	16						01	05	08	10	13	07	03				05	07	21	20						
Corn grain 1	17						01	07	12	14	18	10	04						04	06	10	10	04		
Corn grain 2	18						01	07	12	14	18	10	04						04	06	10	10	04		
Corn grain 3	19						01	07	12	14	18	10	04						04	06	10	10	04		
(Soybeans)	20																								
(Dry beans)	21																								
Dairy cow	23	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Heifer	27	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2